

Level II:

WIC Certification Program



Infant Nutrition Module

Infant Feeding from Birth to 12 Months

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Infant Nutrition Module – Objectives

After completing this module, the learner will be able to:

1. Identify the types of milk that are appropriate to feed a baby during the first year of life.
2. Explain why breast milk is the best milk for babies in their first year of life and identify the benefits of breastfeeding.
3. Identify the brand names of standard infant formulas that are made from cow's milk and the brand names of infant formulas that are made from soybeans.
4. Identify how to dilute or mix the following forms of infant formula: powdered, concentrated, and ready-to-feed.
5. Identify the only reasons to issue ready-to-feed formula.
6. Explain why it is extremely important that powdered and concentrated infant formulas be mixed with the proper amounts of water.
7. Explain to a participant why sterilization and sanitation measures used during bottle preparation are very important.
8. Identify how long prepared formula can be safely stored in the refrigerator.
9. Identify how to warm expressed breast milk or formula and check for the correct temperature.
10. List the only three items that should be fed from a bottle.
11. State the importance of burping the baby during and after feedings.
12. Recognize babies' hunger and fullness cues.
13. Identify why cow's milk is not recommended for babies during the first year of life.
14. Recognize appropriate and inappropriate feeding practices for babies.
15. Identify the foods that supply iron for a baby and explain how iron absorption can be increased.
16. Answer a participant's basic questions about responsive feeding of newborn babies--birth to 6 months old.
17. State when solid foods should be introduced in a baby's diet, and recognize the indicators of developmental readiness for introduction of solid foods.
18. Identify when appropriate to refer to health care providers before highly allergenic foods are introduced
19. Identify appropriate foods to feed a 6 to 8 month old baby.
20. Identify appropriate foods to feed an 8 to 12 month old baby.
21. Name foods that should be avoided because they can cause a baby to choke. State how to modify foods to appropriate consistency.
22. State how to prepare homemade baby foods.
23. Identify why commercially prepared baby foods should not be fed directly from the jar.
24. List three suggestions for caregivers to help an older baby self-feed.
25. Explain to a participant the process of weaning a baby from the breast or bottle to a cup.
26. Define "Early Childhood Caries" and list its causes.
27. List appropriate advice for caregivers of babies with constipation, diarrhea, spitting up and colic.
28. Identify and know how to respond to feeding and diet-related Nutrition Risk Factors for babies.
29. Identify risk factors and know how to respond to caregiver's concerns about a baby's growth.

Introduction

Growth during the first year of life is faster than at any other time. A baby's birth weight will usually double by six months of age and triple by the first birthday. Good nutrition during this period of rapid growth is vital to ensure that the baby develops physically and mentally to the fullest potential.

The age recommendations made throughout this module on infant nutrition include the recommended age for a given practice—whether it's introducing solid foods, finger foods, or weaning from a bottle to a cup. All babies progress at their own rate and differences in developmental rates are to be expected. A baby who does not fall within the average age range for readiness to progress to the next feeding method can still be considered normal. If in doubt about a specific behavior or practice, consult the WIC High Risk Counselor.

The caregivers of babies enrolled in WIC receive nutritional assessment and follow up care. Some caregivers will need special nutrition counseling because of certain factors related to their baby's health and diet. It is extremely important that you understand the nutritional risks of infancy and how to identify them. This module reviews important educational points to discuss with caregivers and highlights the infant-related nutrition risk factors.

Section I: Feeding The Infant From Birth To Twelve Months Of Age

Nutrition for the Newborn: Birth to Six Months of Age

The goal of this section is to provide information about feeding babies during the first months of life. During the early months, most of the time spent between parents and caregivers and the baby is in feeding. For the baby who is growing properly, it is important that caregivers trust their baby to share control by feeding the baby on cue (as known as “demand”) and letting him/her eat as much or as little as he/she wants. During these early months, nutritional needs can be entirely met with breast milk or iron-fortified infant formula. Breast milk is normal human nutrition that also contains disease fighting substances and thus is the preferred milk for babies.

If breastfeeding is not chosen and donor (other mother’s) breast milk is not available, iron-fortified infant formula is the recommended alternative. When infant formula is used, proper preparation and handling is important.

Introduction of solid foods should occur around six months of age when babies display all the developmental signs of readiness. Solid foods introduced too early are of little benefit to the baby and may even be harmful due to the possibility of choking, developing food allergies, or causing a baby to consume less than the appropriate amount of breast milk or infant formula. Introducing solid foods too late may cause a baby to develop nutritional deficiencies and/or miss the period of developmental readiness. Even after solid foods have been introduced, the American Academy of Pediatrics and other major medical organizations strongly recommend that babies continue to breastfeed or receive an iron-fortified formula through their first year of life or longer as mutually desired by mother and baby.

Breastfeeding Is Best

Breast milk is the best milk and appropriate nutrition for babies in their first year of life and thereafter as long as mutually desired. Breast milk is perfectly suited to the nutritional and developmental needs of the baby, which makes it far superior to infant formula and cow's milk.

Benefits of Breastfeeding

The following is an abbreviated list of benefits provided to the baby and mother when breastfeeding (refer to the *Breastfeeding Module and Resource Manual* for a more complete list):

- The nutrient composition of breast milk is ideal:
 - While formula contains nutrients necessary for growth, breast milk has the perfect composition, contains additional nutrients not in formula, and changes as the baby's needs change. Breast milk is easily digested and nutrients are easily absorbed.
 - Constipation is rare among breastfed babies.
 - The fat (lipid) portion of breast milk is almost completely digestible, providing an excellent source of calories for energy.
 - Breast milk contains the appropriate amount of cholesterol, more than in cow's milk and infant formula. Cholesterol is a necessary component in the formation of myelin, the covering of the nerve and brain cells. This covering is necessary for the development of muscular coordination of the baby during the first year of life.
 - Breast milk contains factors that aid the absorption of iron and zinc.
 - Breastfed babies have fewer illnesses than formula-fed babies. Breast milk is rich in antibodies that protect the baby against infection and serious illness, including diarrhea, respiratory infections, and stomach/intestinal illnesses.
- Breastfeeding is easier to manage than bottle feeding.
 - There is no mixing, measuring, or sterilizing involved with breastfeeding.
 - Breast milk is always at the correct temperature for the baby.
 - Breast milk is very portable and always ready when it is needed.
- Overfeeding the baby becomes less likely because the mother cannot tell how much the baby has ingested during breastfeeding and, therefore, cannot encourage the baby to "finish the bottle." This relates to one of the reasons why formula fed babies are at greater risk for becoming overweight.
- There is less likelihood of developing allergies. Breast milk promotes maturation of the gastrointestinal tract to prevent allergens from entering the body. Cow's milk proteins are highly allergenic and early exposure can result in allergic symptoms later in life.
- The mother-baby bond may be enhanced.
- Breast milk saves money. There is no need for expensive formulas and fewer trips are made to the health care provider's office with a sick baby.

Support of Breastfeeding

Breastfeeding is recognized by health care professionals as the best feeding choice for babies. The Academy of Nutrition and Dietetics, The American Medical Association, The American Public Health Association, and The American Academy of Pediatrics developed statements supporting the promotion and support of breastfeeding. In order for breastfeeding to be successful, there must be a strong emotional support system for the mother. This support system includes WIC staff, the family, employers, health care providers, and other mothers who have successfully breastfed their babies. The mother needs breastfeeding information before she starts, and continued information and support while breastfeeding.

There are few conditions where breastfeeding is contraindicated, such as if the woman has tested positive for HIV (the virus that causes AIDS), has active, untreated tuberculosis, or the baby has classic galactosemia.

SELF-CHECK: PRACTICE YOUR KNOWLEDGE

The following begins a series of Self-Checks that occur throughout this module. As you come to each Self-Check, complete it right away. The answers are located at the end of the Self-Check.

1. List two reasons why the recommended age for starting solid foods to babies is around 6 months of age.
 - a.
 - b.
2. Which of the following are reasons why breast milk is the best milk for babies? Circle the letter(s) of the correct answer(s).
 - a. It is perfectly suited to the nutritional needs of a baby.
 - b. Breast milk has special substances that protect a baby against infections.
 - c. Breast milk is portable and ready to feed on demand.
3. True (T) or False (F)?
 - ☐ a. Breast milk is easily digested and nutrients are easily absorbed.
 - ☐ b. Constipation is common among breastfed babies.
 - ☐ c. Breast milk is always at the correct temperature while baby is nursing.
 - ☐ d. Breast milk is rich in antibodies that protect the baby against infection and serious illness.

ANSWERS

1.
 - a. Babies have no nutritional need for solid foods before 6 months of age.
 - b. Babies are not developmentally ready to eat solid foods before this age.
2. a, b, c
3.

a. T	c. T
b. F	d. T

Formula Feeding

Although breast milk is normal nutrition and ideal for a baby, iron-fortified infant formula is the recommended alternative. It is important that for the first year of life the formula be iron-fortified to prevent iron deficiency anemia. Low iron formula puts the baby at risk for more illness, delays in mental and motor development and impaired energy metabolism.

Infant formulas are formulated to be nutritionally similar to breast milk to promote adequate infant growth.

Types of Infant Formulas

There are several different types of infant formulas:

- Cow's milk-based formulas such as Enfamil Infant®, Gerber Good Start® Gentle and Similac® Advance® 20 are made from cow's milk. Most babies do well on formulas made from cow's milk.
- Soy milk based formulas such as Enfamil ProSobee®, Gerber Good Start® Soy and Similac® Soy Isomil® 20 are made from soybeans. These formulas were developed for babies who are unable to tolerate cow's milk formulas.

Several kinds of special or exempt formulas are produced for babies who have specific problems such as prematurity, certain diseases, or physical disabilities. These formulas are usually more expensive, and must be prescribed by health care providers for a specific period of time. WIC requires the WIC High Risk Counselor approve issuance of these formulas. A counseling session with the High Risk Counselor is required if the baby has a high risk nutrition risk factor condition.

Formula Packaging

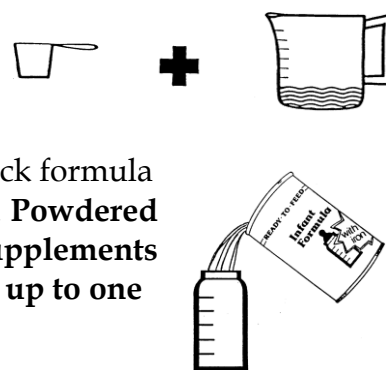
The milk-based and soy-based formulas are available in powdered, concentrated, or ready-to-feed (RTF) forms.

Did You Know . . .

Infant formula manufacturers supplement infant formulas with two fatty acids, docosahexanoic acid (DHA) and arachidonic acid (ARA). DHA and ARA are present in breast milk and are thought to be associated with visual and mental development in babies. The theory is that formulas enhanced with DHA and ARA may promote improved visual and mental development outcomes in formula-fed babies, more similar to breastfed babies. While research suggests that some premature formula-fed babies may benefit from DHA and ARA supplementation, studies involving term babies are inconclusive.

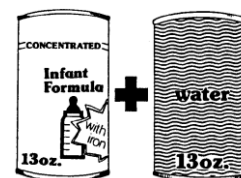
Contrary to popular belief, the iron in iron-fortified formulas does NOT cause gastrointestinal distress such as constipation, colic, and diarrhea in babies. For more information on this topic, refer to the American Academy of Pediatrics Position Statement on Iron Fortification of Infant Formulas, July 1999, found in the Colorado WIC Formula Guide.

Powdered formula is usually mixed with water in a ratio of one scoop formula to two ounces of water. (The scoop is included in the can). The formula can label gives exact dilution directions. When mixing powdered formula, fill the bottle with water first, and then add the formula to the water. Educate caregivers not to pack formula tightly in the scoop. Powdered formula comes in different size cans. **Powdered formula is suggested for breastfed infants who receive formula supplements because, once opened, the can of powdered formula can be stored up to one month**



Concentrated liquid formula requires dilution with water in a one-to-one ratio; that is, one can of concentrated formula is mixed with one can of water. The can size is 13 ounces.

An easy way to tell caregivers how to mix concentrated formula with water is to pour the contents of a 13-ounce can of concentrated formula into a **clean** container. Fill the can with boiled water and pour this water into the container with the concentrated formula. Mix well. With this method the caregiver doesn't have to worry about the "exactness" of the ounce-for-ounce mixing.



The final mixture is 26 ounces of prepared formula (13 ounces of concentrated formula plus the 13 ounces of water). Pour the mixture into clean bottles. This is similar to the method used to prepare frozen orange juice, where the empty can becomes the measuring device.

Ready-to-feed formula requires no mixing or diluting with water and is available in bottles and cans of various sizes. Ready-to-feed formula is generally the most expensive. The WIC High Risk Counselor may approve ready-to-feed formula only under the following special circumstances and the reasons for issuance must be documented in the chart:

- The family's water supply is contaminated and unsafe for consumption
- The caregiver has difficulty correctly diluting concentrate or powdered formula
- For a medically fragile (i.e. Premature) baby
- The formula is only available in ready-to-feed form.

Formula Preparation

When preparing formulas for feeding, it is very important that caregivers follow the directions on the label to correctly mix the formula and to handle it carefully to avoid contamination. It is very important for WIC staff to evaluate if the formula is mixed or prepared according to the health care provider and label instructions. The infant Nutrition Interview in Compass includes a question that asks how the formula is being mixed. Review this information with the caregiver. **WIC staff should not recommend caregivers change the formula dilution unless the WIC High Risk Counselor has discussed it with the health care provider.**

****Important Note****

Some exempt formulas are mixed at different ratios of formula to water. The directions on the formula can provide instructions on appropriate mixing.

Once a can of concentrate or ready-to-feed formula is opened or prepared, it should be covered and can be safely fed to the baby if refrigerated up to 48 hours. Once formula is prepared from powdered formula, it can be safely fed to a baby if refrigerated up to 24 hours. Once a can of powdered formula is opened, it should be covered and stored in a cool, dry place for no longer than one month.

Cleaning and sterilizing the bottles: Babies 3 months of age and younger are more likely to contract illnesses from micro-organisms in bottles and nipples that are improperly cleaned, cleaned in contaminated water, or filled with contaminated water. Therefore, for babies less than 3 months old, glass or hard plastic bottles and bottle parts (nipples, caps, rings) should first be thoroughly cleaned using soap, hot water, and bottle and nipple brushes, and then either:

Washed in a properly functioning dishwasher machine -
or- Sterilized in boiling water

The following describes the steps to be taken for sterilizing bottles in boiling water:

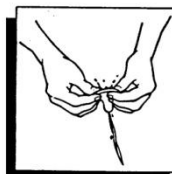
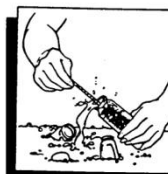
1. The preparer should thoroughly wash his/her hands and wash bottles, nipples, caps, rings, and tongs in hot, soapy water, using a bottle brush. Squeeze clean water through nipple holes to be sure they are open. Rinse well.
2. Place these objects in a large pan and cover with water. Boil for 5 minutes with the lid on. Let cool. Remove bottle supplies from pan with tongs and place on clean cloth or paper towel to air dry.
3. Cleaning and sterilizing bottles by either of the above methods should be continued until the baby is at least 3 months old. This same process should be used for bottles that will contain expressed breast milk. If disposable plastic bottle liners are used, the bags should be discarded after one use and the

Bottle and Formula Preparation and Sterilization

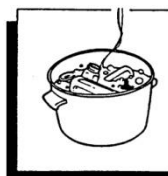
1. Wash Hands:



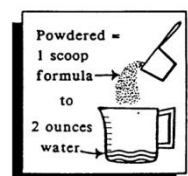
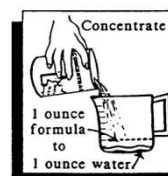
2. Wash Bottles:



3. Sterilize Bottles:



4. Prepare Formula



nipples, rings, and caps sterilized in boiling water or washed in a dishwasher until the baby is at least 3 months old. After 3 months, unless otherwise indicated by a health care provider, bottles should be thoroughly washed using a bottle brush, soap, and hot water, or cleaned in a dishwasher.

Preparing the water: Formula makers provide directions for mixing their products with water, but don't specify the water source. In general, tap water from a municipal system is safe to use. (To learn more about your tap water, ask your water provider if a Consumer Confidence Report is available.) As an added precaution for infants under 3 months of age, it's a good idea to use water that has been boiled for 1-5 minutes (one minute for residence at <6,500 feet, 3 minutes for residence between 6,500 and 8,000 feet, and 5 minutes for residence at >8,000 feet elevation). Allow cold tap water to run for a short period of time (about two minutes) before collecting the water.

Some parents use bottled water or "nursery" water to mix infant formula because of fear of water safety. Counsel parents to treat bottled water the same as tap water – as an added precaution it should be boiled for use with infants younger than 3 months.

If the family is using water from their private well encourage them to learn about the safety of their home's water. They may need to have their water tested for bacteria, nitrates, and heavy metals (e.g., lead) contamination by the local health department. Nitrates in drinking water at levels above 10 ppm is a health risk for infants of less than six months of age. Boiling water will not free the water of nitrates or heavy metals, and because of the evaporation of the steam, the nitrates or metals will actually be concentrated in the remaining water. If the quality of the water is undesirable, the family should use store-bought bottled water.

Preparing Powdered Infant Formula:

The preparer should thoroughly wash his/her hands and wash the top part of the formula can before opening in order to eliminate contaminants such as bug spray, dust, roach droppings, etc. The can opener should also be washed.

Cleanliness during formula preparation and proper refrigeration of bottles is very important through the first year of life because these measures help prevent gastrointestinal problems and illness caused by bacteria.

Fluoride content in water is another issue that must be considered, whether tap or bottled water is used.

Fluoridated water is beneficial in reducing tooth decay. However, excessive amounts of fluoride can cause staining or "mottling" of the tooth enamel.

Safe Advice:

Formula should never be made with water from the hot water faucet. The hotter the water runs through a lead pipe, the greater the risk of leeching lead into the water. Please remind moms to use **COLD** tap water, have them boil it for the recommended amount of time, and then mix appropriately with formula.

Refer the caregiver to the physician or dentist for suggestions on how to give the right amount of fluoride to their infant. This table shows acceptable fluoride concentrations for bottled water given to infants as their primary water source.

Fluoride Concentration Guidelines for Bottled Water Given to Babies:

Age	Optimal	Minimal	Maximum
Birth to 6 months	0.7 mg/L	0.0 mg/L	1.2 mg/L
6-12 months	0.7 mg/L	0.3 mg/L	1.2 mg/L

NOTE: Carefully read the label on the formula can for the appropriate directions for dilution. Only a health care provider should make any variation from the recommended dilution.

Improper dilution of formula can result in very serious health problems for the baby. Formula mixed with too little water might be too concentrated for a baby to digest easily. Formula mixed with too much water might not supply the calories needed for recommended growth and may provide an overload of water that can be equally dangerous to the baby.

Mixing the formula

Mix concentrated or powdered formula with the boiled water once it has cooled to warm bath water temperature (100 degrees F) in a clean container according to the label on the can. Powdered formula mixes best at this temperature

Powdered – Fill a bottle with 4 ounces of water. Add 2 scoops of the powdered formula.
Concentrated – Mix 2 ounces of the concentrated formula with 2 ounces of water.

Reasons caregivers incorrectly dilute formula

There are a variety of reasons why a caregiver may not follow the instructions for proper dilution. Some reasons caregivers **over-dilute** formulas (formula mixed with too much water) are because they believe:

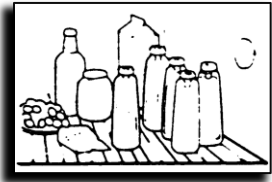
- It will help a baby with constipation, spitting up, diarrhea,
- It will help control the baby's weight,
- It will reduce the amount of iron to the baby
- It will make the formula last longer.

Some reasons caregivers **over-concentrate** formula (formula mixed with too little water) are due to the belief that:

- It will help the baby sleep through the night,

- It will help the baby grow faster,
- It will thicken the formula to fill the baby up.

Also some caregivers have difficulty measuring the formula, and therefore, over-concentrate it.



Storing the formula

It is best to keep the formula in its original container and fill bottles as needed. Using tongs, place nipples (upside down), disc seals, and caps on the filled bottles.

Bottles of concentrate or ready-to-feed formula should be refrigerated and used within 48 hours from when they were prepared. Bottles prepared from powdered formula should be refrigerated and used within 24 hours. Formula can be kept up to 1 hour without refrigeration.

Unused Formula

Formula left in the bottle after a feeding must be thrown away because it has the baby's saliva mixed in with it, and this provides an ideal breeding ground for bacteria. If formula is offered to a baby and the baby drinks it for 5 minutes and then stops, it should be thrown away after one hour if the baby doesn't continue to drink. Also, a dropped bottle whose nipple has come into contact with the floor or another unsanitary source should not be given to the baby.

If the caregiver plans to take the baby with her on an "outing" (shopping, clinic appointment, etc.), it is important that proper care is taken with the baby's bottles packed in the diaper bag. The formula in the bottles should start out very cold. The bottles should be insulated (wrapped in a thick cloth) to keep them cold. If the caregiver will not have access to refrigeration for a very long time, it is a good idea to use powdered formula, mixed at the time of feeding.

Proper Feeding Temperature of Formula

Babies can be fed formula that is room temperature, slightly cooler, or slightly warmer. If a baby prefers a warm bottle, special care must be given not to warm the formula beyond body temperature. The best way to warm a bottle of previously prepared or ready-to-feed infant formula is to set it in a pan or bowl of warm water for a few minutes or shake it under warm tap water.

A few drops of formula on the wrist are a good test of temperature: if it feels slightly warm on the wrist, it is the correct temperature for the baby.

DO NOT use microwaves to warm breast milk or formula!

The following risks are too great and outweigh the convenience of using microwave ovens for heating expressed breast milk or infant formula:

After microwaving, glass or plastic bottles can remain cool to the touch while the breast milk or formula inside them can be scalding hot. Microwaving also heats liquids unevenly. The breast milk or formula may feel lukewarm to touch and will contain scalding hot spots. After microwaving, breast milk or formula in bottles with disposable plastic liners can become so hot that the plastic liners may burst.

The heat of the microwave oven can destroy antibodies in breast milk. The correct way to warm breast milk is to take the milk out of the refrigerator just before using. Gradually, over 5 to 10 minutes, warm the milk to room temperature in a container of warm water. To use frozen breast milk, thaw the milk either in the refrigerator, where it can remain up to 24 hours, or in water just before feeding, gradually increasing the temperature from cool to warm. Do not defrost the milk in a microwave or over the stove.

SELF-CHECK: PRACTICE YOUR KNOWLEDGE

1. Circle the infant formulas that are made from cow's milk. Underline the ones that are made from soybean milk.

Enfamil Infant®

Similac Advance® 20

Gerber Good Start Soy®

Enfamil ProSobee®

Gerber Good Start Gentle®

Similac Soy Isomil® 20

2. Cow's milk-based formula and soy-based formula are packaged in three different forms: concentrated, powdered, and ready-to-feed. Briefly describe how to mix or dilute each one.

Concentrated:

Powdered:

Ready-To-Feed:

Complete the sentences to make accurate statements in questions 3, 4 and 5.

3. Improper dilution of infant formula can result in _____.
4. Sterilization of water and bottles (for babies 3 months of age and younger) and overall cleanliness during formula preparation are necessary in order to prevent illnesses from microorganisms.

5. Liquid formula (RTF or prepared from concentrate) may be stored in the refrigerator up to _____ hours after the formula can has been opened. Formula prepared from powder may be stored in the refrigerator up to _____ hours after being mixed.

ANSWERS

1. Cow's milk: Enfamil Infant®, Similac Advance® 20, Gerber Good Start Gentle ®
Soy milk: Enfamil ProSobee®, Similac Soy Isomil® 20, Gerber Good Start Soy®
2. **Concentrated:** Requires dilution with water in a one-to-one ratio. Mix equal amounts of formula and water.

Powdered: Mixed with water in a ratio of one scoop formula to two ounces of water. The directions on the formula can will give the exact dilution requirements.

Ready-To-Fed: Requires no preparation; no mixing, no diluting.
3. Improper dilution of infant formula can result in very serious health problems for the baby. Formula mixed with too little water might be too concentrated for a baby to digest easily. Formula mixed with too much water might not supply calories needed for recommended growth and may provide an overload of water that can be equally dangerous to the baby.
4. Sterilization of water and bottles (for babies 3 months of age and younger) and overall cleanliness during formula preparation are necessary in order to prevent illnesses from microorganisms.
5. Liquid formula (RTF or prepared from concentrate) may be stored in the refrigerator up to 48 hours after the formula can has been opened. Formula prepared from powder may be stored in the refrigerator up to 24 hours after being mixed.

Cow's Milk During the First Year

Fresh or powdered milk (whole, 2%, 1%, and fat-free), evaporated milk, sweetened condensed milk, soy milk, almond milk, goat's milk and other non-dairy milks are not recommended for babies during the first year of life. WIC and the American Academy of Pediatrics strongly recommend that babies continue to be breastfed or receive an iron-fortified formula through the first year of life.

Some of the reasons cow's milk (whole, 2%, 1% fat-free, powdered) is not acceptable for babies before age one are:

- Cow's milk has a higher level of protein and minerals than breast milk or iron-fortified infant formulas. This is not desirable for babies because the high levels of protein and minerals place stress on the kidneys of the young baby.
- The immature digestive system of the young baby is not able to adequately break down cow's milk.
- In the early months, the feeding of cow's milk has been associated with gastrointestinal blood loss, which puts the baby at risk for the development of iron-deficiency anemia.
- Fresh or powdered cow's milk, evaporated milk, sweetened condensed milk, goat's milk and other non-dairy milks (e.g., soy milk) are poor sources of iron. Prolonged use in early infancy may result in iron-deficiency anemia. These types of milk do not contain many essential nutrients such as vitamin C, some B vitamins, folate, and some minerals that are needed for growth and development of the baby.

Beyond 12 months of age, breast milk continues to be appropriate as long as mutually desired by mother and baby. Whole milk is recommended for most children between 12 to 24 months of age. However, the American Academy of Pediatrics recommends the use of reduced-fat milk for children who are overweight or obese or have a family history of obesity, dyslipidemia (high cholesterol or fat in the blood), or cardiovascular disease (condition that involves narrowed or blocked blood vessels that can lead to a heart attack, chest pain or stroke.). After age two, 1% or fat-free milk is encouraged for all healthy children who are growing well.

Feeding the Newborn

The close physical contact during feeding creates healthy social and emotional development. Caregivers gain a sense of responsibility by caring for their baby, and quickly become experts at communicating, soothing, and handling their baby. However, when it comes to feeding their babies, caregivers may experience frustration when they cannot easily interpret their babies' cues, and often have a lot of questions.

Newborn babies, whether breast or bottle-fed, need to eat small amounts of breast milk or infant formula often throughout the day and night because their stomachs cannot hold a large quantity. A baby's digestive system is not designed to go an extended amount of time without food. Babies need the important nutrition that night feedings can provide for growth and development. Night feedings are also important for the breastfeeding mother because they help maintain a healthy milk supply and prevent the mother's breasts from becoming overly full.

Hunger and Fullness Cues

Newborn babies should be fed when they are hungry and eat until they are full. This is called feeding "on cue" or feeding on demand. Babies give cues to "tell" others what they need. Common questions caregivers may have are:

- "How much or how often should I feed my baby?"
- "How can I tell when my baby's ready to eat?"
- "How long does a feeding last?"
- "How can I tell if my baby's eating enough?"

While there are general guidelines that address these questions, the truth is, babies are usually excellent at communicating when they are hungry and when they are full. Babies use both obvious and subtle cues to communicate these needs. That means caregivers need to be aware of these cues and should avoid strict feeding schedules.

Feeding on cue helps the baby connect feelings of hunger and fullness with the beginning and end of a feeding and helps the baby learn to eat based on his appetite. Most babies will feed every 1½ to 3 hours (8 to 12 times in a 24-hour period) during the early weeks of life. Sleepy babies may need to be awakened to feed. The amount of time between feedings typically increases as the baby grows older. Newborn feedings can be expected to last 20-30 minutes. Babies may feed more during growth spurts, usually around 2-3 weeks, 6 weeks, and 12 weeks. Growth spurts generally last 2-3 days.

Most newborns lose weight the first few days of life. Usually they lose no more than 8% of their birth weight. However, they should regain that weight within one week. That would mean that an 8-pound baby at birth might lose up to 10-ounces during the first few days of life. A baby that loses more than 8% of their birth weight should be evaluated immediately by a health care provider.

By the time they are 4 to 6 months old, babies typically have doubled their birth weight, gaining about 4 to 7 ounces per week. Babies typically triple their birth weight by 1 year of age, gaining about 3 to 5 ounces per week from 6 to 12 months of age.

Caregivers play a key role in helping babies feel comfortable and safe by learning to recognize and respond to their babies' needs. It's important that caregivers recognize when a baby is full. Trying to force a baby to take extra formula or breast milk can lead to a negative feeding

relationship. By ending a feeding when the baby shows signs of fullness, a caregiver reinforces the baby's natural ability to stop eating when he/she is satisfied and prevents overfeeding.

Recognizing Hunger Cues

When babies are hungry, they will do everything they can to communicate it. These cues are clustered, meaning babies will use multiple cues together to convey their hunger. Hunger cues include:

- Clenched fingers;
- Fists over their chest and tummy;
- Bringing hands to their face;
- Flexed arms and legs;
- Mouthing, rooting (looking for the nipple);
- Fast breathing, and sucking noises or motions.

Some caregivers may think that crying and waking are hunger cues, but these behaviors on their own without any of the other cues aren't signs of hunger. Caregivers may need help learning to recognize hunger cues so they understand when they see hunger cues, they should feed their babies. When caregivers respond to these early hunger cues, they can reduce crying. Late hunger cues include furrowing the brow, moving the head frantically from side to side and crying.

It's important for caregivers to learn the difference between hunger cues and other cues. A hungry baby may cry, but he will also show other cues first. Encourage caregivers to be flexible and responsive to their baby's signs of hunger before he reaches the late stage of crying. Suggest caregivers talk with their health care provider if they have concerns about growth or persistent crying (inconsolable crying, crying that continues in spite of soothing, changes in environment or other interventions).

Recognizing Fullness Cues

Similar to hunger cues, clustered cues are commonly used together to indicate fullness/satisfaction. Signs of satiety and fullness are when the baby:

- Ends the feeding by releasing the breast;
- Turns away from breast or bottle;
- Sucks slower or stops sucking;
- Pushes away;
- Seals the lips together;
- Seems content and calm;
- Falls asleep;
- Hands, toes, legs and arms open and become relaxed.

Sleeping Through the Night

A big milestone that many caregivers look forward to celebrating is when their baby sleeps through the night. Caregivers may share their sleep stories and strategies for getting babies to sleep through the night at an early age. New caregivers receive a lot of conflicting information about what is normal. It is commonly thought that feeding infant cereal at a very early age will help the baby sleep through the night. Research studies have failed to find truth in this common belief.

Another misconception is the belief that breastfed babies sleep differently than formula-fed babies. Although there are a few differences, studies show minimal difference in *maternal* sleep among mothers who exclusively breastfeed, combo feed, or formula-feed their babies. Babies differ in the age they are ready to sleep through the night without feedings. By six months, babies may be able to sleep up to six hours in one stretch of time. This number is only a guide, every baby is different. Babies, who begin sleeping through the night, may resume night feedings during periods of rapid growth or teething. This is normal baby behavior. Starting solid foods before a baby is developmentally ready, or offering “extra” breast milk or formula will not make a baby any more likely to sleep through the night. WIC staff can help caregivers understand that it is normal to get less sleep with a baby and that sleep patterns will change as the baby gets older. Work with caregivers to help them find ways to function despite the sleep deprivation that comes with the need to care for their babies during the night. Introducing solids too early can be harmful. For more information refer to Level II module 4, *Sleepy Time*, of the Baby Behavior online course.

Positive Caregiver- Baby Interactions

Over time, caregivers become more skilled at understanding their baby’s cues. As they feed their baby, caregivers learn how their actions comfort and satisfy.

A healthy feeding relationship involves a division of responsibility between the caregiver and the baby. The caregiver sets an appropriate, safe, and nurturing feeding environment and provides appropriate, healthy foods. The baby decides when and how much to eat. In a healthy baby-caregiver feeding relationship, responsive care giving involves:

- Responding early and appropriately to hunger and fullness cues
- Recognizing the baby’s developmental abilities and feeding skills
- Balancing the baby’s need for assistance with encouragement of self feeding
- Allowing the baby to initiate and guide feeding interactions

Successful interaction between a caregiver and baby involves three steps: Look – Recognize – Respond. The purpose of this 3-step assessment is to describe how to help a caregiver understand what his or her baby is trying to communicate. Refer to Level II module 8, *Caregiver- Infant Interactions*, of the Baby Behavior online course for more detailed information on positive interactions.

Typical Breast Milk and Formula Intake

The frequency of breastfeeding or quantity of formula a baby consumes in 24 hours varies depending on the baby's age, size, and level of activity. Babies should be fed as they need it, "on cue"; using the babies early hunger cues as a guide. Offer the caregiver special instructions to watch for the first signs of fullness (decrease in sucking, lack of interest in the feeding, etc.) to prevent overfeeding. Encourage caregivers to let the baby decide how much to eat. Throw away any breast milk or formula remaining in the bottle if not used within 1 hour after the feeding. Do not encourage or force the baby to finish the bottle.

Babies do not always get hungry on a schedule and do not always take the same amount at a feeding. Let the baby decide how much to eat. However, table 1.1 illustrates typical breast milk/formula daily intake.

Table 1.1

These are general guidelines for healthy full-term infants. These ranges may not apply to all babies.

Breastfed Infants:

- 8-12+ feeding/24 hours; as the infant becomes older, the time between feedings will increase as the capacity of the baby's stomach becomes larger.

Bottle-Fed Infants (formula or breast milk):

- Newborn infant may drink 1-2 ounces every 2-3 hours
- 1-2 month old infant may drink 2-3 ounces every 2-3 hours
- 2-3 month old infant may drink 4-5 ounces every 3-4 hours
- 3-4 month old infant may drink 5-6 ounces every 3-4 hours
- 4-6 month old infant may drink 6-8 ounces 4-6 times a day

Signs of Adequate Intake

Babies who are fed on cue usually consume the amount they need to grow well. Growth of exclusively breastfed babies during the first 6 months may exceed that of other babies, but formula-fed babies may gain more rapidly during the remainder of the first year.

Adequate infant growth is the best indication that a baby is getting enough breast milk or infant formula.

Caregivers may have concerns whether their baby is gaining enough weight or growing appropriately. Monitoring a baby's growth over time is the best indicator that a baby is getting enough breast milk or formula. While, it is important to find out the number of wet diapers, frequency of nursing, and/or actual amount of formula that the baby is consuming during the nutrition interview, checking the baby's growth is the only sure way to know if a baby is getting the right amount of calories to meet his/her energy needs. Refer to the Level 1: Screening Module for more information on growth and measurement.

During the first few days of life, wet and dirty diapers gradually increase. Breastfed and formula-fed babies should have at least 6 wet diapers a day by the fifth day of life. The urine

should be clear. Breastfed babies should have 4 or more dirty diapers whereas formula-fed babies may not stool as frequent or as soft. After about 6 weeks of age, the older baby may stool less frequently. If there is no abdominal discomfort, less frequent stools may be normal and not constipation.

Understanding Crying

Babies use crying to communicate many different things, not just hunger. All babies cry, and it's normal and healthy for them to do so when they need something. When babies are hungry, they give several cues at once. Teach caregivers to watch for early hunger cues. For example, a baby may suck on his hand, root, and make sucking noises all at once. Watching and responding to early hunger cues can help prevent some crying. If a baby displays hunger cues and all other needs are met, the baby is most likely hungry. Feeding "on cue" will not spoil the baby.

SELF-CHECK: PRACTICE YOUR KNOWLEDGE

1. Circle the types of milk that are good to feed a baby during the first year of life:

Breast milk

Iron-fortified infant formula

Sweetened condensed milk

Fresh whole cow's milk

Goat's milk

2%, 1%, cow's or fat-free milk

2. True (T) or False (F)?

___a. Feeding "on cue" will spoil a baby.

___b. To prevent overfeeding, a caregiver should look for signs of fullness, such as a decrease in sucking and lack of interest in the feeding.

___c. Babies differ in the age at which they are ready to sleep through the night without feedings.

___d. Fresh and powdered milk (whole, 2%, 1%, or fat-free) are good sources of iron for older babies.

___e. Crying is always a sign of hunger.

___f. Babies may feed more during growth spurts, typically at 2-3 weeks, 6 weeks and 12 weeks.

___g. Mothers who formula feed will get more sleep than mothers who breastfed.

ANSWERS

1. Iron-fortified infant formula
Breast milk

2. a. F
b. T
c. T
d. F
e. F
f. T
g. F

Feeding with a Bottle

Bottles are appropriate for feeding babies who are not developmentally ready to drink from a cup. However, bottles must be used properly.

Types of bottles to use

Encourage caregivers to use BPA-free bottles. BPA or Bisphenol A is an estrogen-like compound used to make items such as shatterproof plastic baby bottles, food can linings, bike helmets and eyeglass lenses. With regular use, BPA can leach into foods. The degree to which BPA leaches from polycarbonate bottles into liquid may depend more on the temperature of the liquid than the age of the container. BPA can also be found in breast and cow's milk. Although at this time no one knows for sure if BPA is harmful to humans, in some studies with animals BPA has been shown to affect certain reproductive glands and cause early reproductive development in females.

Only plastic that has the number 7 stamped on the bottom is of concern, although not all number 7 plastic contains BPA.

What-and What Not-to Put into a Bottle

Only three items should be fed from a bottle:

- Breast milk which has been "expressed" (removed from the breast by hand techniques or use of a breast pump)
- Infant formula
- Water, but not given routinely: Breast milk and properly-diluted infant formula provide babies with enough water. Supplemental water generally is not indicated for healthy babies who are not receiving solid foods. It can also fill the baby's stomach and cause a feeling of fullness which can decrease a baby's desire to feed. Discourage caregivers from giving water to babies less than 6 months of age. Babies with diarrhea or vomiting should be referred to their health care provider.

There are many items that should **never** be fed from a bottle:

- **Cereals and pureed foods:** Solid foods should not be fed until the baby is developmentally ready to take these foods from a spoon (usually occurs around six months of age). Feeding solids from a bottle will not help the baby sleep through the night and may lead to overfeeding. Also, feeding infant cereal in a bottle or "infant feeder" can cause choking.
- **Juices:** Juice should not be introduced until the baby is developmentally ready to drink juice from a cup (usually occurs around seven months of age). Feeding juice from a bottle may lead to tooth decay and an over-consumption of juice. When offering juice use a cup without a lid. Parents should be discouraged from allowing babies or toddlers to carry cups, especially cups with lids designed to prevent spilling, around

with them. This practice can lead to excessive consumption of juice. Limit juice intake to about two ounces a day.

- **Sweeteners:** Adding sweeteners of any kind including honey, agave nectar, syrup, sugar, Kool-Aid, sports drinks, powdered or liquid drink mixes, or "gelatin water" to the bottle is inappropriate. These sweeteners can result in excessive caloric intake and tooth decay.

In addition, honey may contain botulinum spores that are responsible for the very serious food poisoning– **botulism**. *Botulism can cause severe illness and death in babies.* Thus, honey should not be given to a baby under one year of age.

Making Baby Comfortable When Bottle feeding

There are proper ways to hold a bottle while feeding a baby. To make bottle feeding safe and comfortable for babies, encourage caregivers to do the following:

- Hold the baby during feedings in the cradle of the arms or lap. This helps the baby feel secure, as the baby is able to look at the caregivers face and the caregiver is able to read and respond to the baby's cues. When in this position the baby's head should be a little higher than the rest of the body, this prevents choking, and milk from backing up in the inner ear and causing an ear infection.
- The bottle should be tilted so that the neck and nipple are always filled with breast milk or formula. This will help prevent the baby from swallowing air. Swallowed air can lead to a decrease in intake because the baby will feel full early in the feeding. It also can cause discomfort for the baby. The baby may be burped at any natural break in or at the end of a feeding to remove swallowed air. There is no need to burp a baby after a certain amount of time or after every couple of ounces because this can be disruptive to the feeding. A baby can be burped by gently patting or rubbing the baby's back while he or she is held against the front of the caregiver's shoulder and chest or held and supported in a sitting position in the caregiver's lap.

Crying or fussiness is not always an indication of hunger. Help caregivers understand that breastfeeding or bottle-feeding should not be used as a substitute for attending to a baby's other needs. Holding and rocking the baby, changing the baby's diapers, or offering a pacifier when the caregiver is certain the baby isn't hungry is often adequate to soothe a baby. Pacifiers should not be offered to breastfed babies during the time when a mother is establishing her milk supply (around infant's first 4 weeks of life).

Propped Bottles Lead to Problems

A baby who is bottle-fed should always be held during feeding while they are too young to hold their own bottle. Holding, touching, and establishing good eye contact increases bonding between the caregiver and baby and enables the caregiver to learn their baby's hunger and fullness cues.

Strongly discourage the practice of propping the bottle with a pillow or blanket. "Bottle propping" is not a safe practice. The baby may choke on the liquid and the fluid can get into the lungs. Furthermore, health care professionals believe that babies who are fed while lying back without their heads being raised a little have a greater incidence of middle ear infections. Caregivers are not engaged with their baby when they prop the bottle and therefore cannot respond to their baby's needs, for example, if the baby wants to stop feeding. The baby is not able to regulate his/her feeding; thus the baby may become overfed. Babies need to be held as part of their development, and feeding time is a good time for holding

Feeding Solids Too Early

There is no advantage to the introduction of solid foods (e.g., infant cereal, jarred or home prepared baby foods) before four months of age. The baby's nutrition needs can be entirely met by breast milk or iron-fortified infant formula from birth to around six months of age.

In fact, some negative effects are associated with the early introduction of solid foods. Early introduction of solids may result in over-feeding, gastrointestinal problems such as constipation and diarrhea for these babies. A young baby who gets solid foods in place of breast milk or formula might get too many calories, gain too much weight, and not enough nutrients to grow and develop properly. This is because infant cereal and other baby foods do not provide the same level of calories and nutrients as breast milk and formula. Young babies who are not developmentally ready for solid foods may choke on solids, which can force these food particles into their lungs. This aspiration (drawing of food or foreign matter into the lungs with the breath) of food particles can result in pneumonia, or even death, in young babies.

Many caregivers have heard that feeding solid foods will help babies sleep through the night; however, research doesn't support this idea. Most babies start sleeping for longer stretches at a time as they get older. The longest stretch can happen during the day or at night. Caregivers may mistakenly associate early introduction of solid foods with improved sleep versus the age of the baby. WIC staff can help support caregivers to understand that they will get less sleep at first, but as the baby gets older their sleep patterns will change and babies may sleep for longer stretches of time. "Sleeping through the night" may not be permanent since many babies resume night feedings during growth spurts or teething. It is commonly thought that feeding infant cereal at a very early age will help the baby sleep through the night. Research studies have failed to find truth in this common belief. It seems that the termination of the night feeding is a developmental stage which is reached at any time from the newborn period to 15 months of age.

SELF-CHECK: PRACTICE YOUR KNOWLEDGE

1. Name the three items that are appropriate to put in a baby's bottle.
 - a.
 - b.
 - c.
2. Name three items that should not be put in a baby's bottle.
 - a.
 - b.
 - c.
3. True (T) or False (F)?
 - ___a. Feeding honey to a baby less than one year of age can cause botulism poisoning.
 - ___b. "Bottle propping" is an acceptable way to feed a baby because it frees up the caregiver to do other things.
 - ___c. Only bottle-fed babies need to be burped during feedings.
 - ___d. Young babies who are not developmentally ready for solid foods may choke, which can force food particles into the lungs.

ANSWERS

1.
 - a. Breast milk
 - b. Infant formula
 - c. Water
2.
 - a. Cereal and pureed foods
 - b. Juice
 - c. Sweeteners
3.
 - a. T
 - b. F
 - c. F
 - d. T

Nutrition for the Infant: 6 to 8 Months of Age

Developmental Readiness for Solid Foods

Physical growth, development and nutrition needs vary significantly in each stage of infancy. Around six months of age, most babies are ready to begin eating solid foods with a soft consistency. Breast milk or infant formula alone are no longer enough to meet all the nutrient needs of the baby. During this time, a baby's oral-motor skills and digestive system are more developed and mature. All of these changes set the stage for starting solid foods. The American Academy of Pediatrics Section on Nutrition recommends complementary foods be introduced into a baby's diet at approximately 6 months of age.

Determining the best time to introduce a baby to solid foods can be difficult. The key is to know when a baby has reached developmental readiness. Some signs of developmental readiness include:

- Sits up alone or with support
- Holds head steady and straight
- Opens mouth when sees food coming
- Keeps the tongue low and flat to receive the spoon
- Closes lips over spoon and pulls food off the spoon
- Tongue thrust reflex diminishes, keeps food in the mouth and swallows it rather than pushing it back out onto the chin.

Complementary (Solid) foods: are foods or beverages other than breast milk or infant formula introduced to a baby to provide additional energy and nutrients to ensure appropriate growth

Around 6 months, the following physical changes occur:

- The baby's immune defense system has matured so that the risk of allergic reactions to solid foods is reduced.
- The baby's kidneys develop so that the body can excrete waste products from high protein foods such as meat.
- The baby's rooting reflex, tongue thrust, suck/swallow reflex, and the gag reflex begin to diminish.

There is a critical time in the development of a baby (around 6 months) when he or she is ready to eat solid foods.

The jaw and muscle development that occurs when a baby eats complementary foods at the appropriate age contributes to later speech development. In WIC, issuance of infant cereal and baby foods can begin when the baby is 6 months old. The first month after a baby turns 6 months old, the computer system automatically changes the food package to add infant cereal, bananas, and baby food fruits and vegetables (and baby food meat for exclusively breastfed babies). If it hasn't yet been discussed, the food package change should prompt staff to ask the endorser about introducing solid foods.

Introducing solid foods later than 6 months of age for babies who are not developmentally delayed may cause negative effects. The baby may then have difficulty developing skills to eat independently. It may also interfere with the baby consuming an adequate variety and amount of food to meet their nutritional needs. Iron levels will start to drop if a baby does not get enough iron in the diet around 6 months of age. Breast milk or infant formula alone does not provide an adequate concentration or balance of nutrients for the older baby.

Therefore, solid foods serve an important purpose in the daily diet of babies who are developmentally ready for them.

Developmental Delays may Affect a Infant's Feeding Skills

A baby's development does not always match his or her chronological age. *Babies may be developmentally delayed in their feeding skills due to:*

- Prematurity
- Low-birth weight
- Multiple hospitalizations
- Failure to thrive
- Neuromuscular delay
- Abuse or neglect
- Depression
- Cleft lip or cleft palate
- Inability to feed by mouth (i.e., fed intravenously or via tube) for an extended period or,
- A medical condition (e.g., Down's syndrome or cerebral palsy).

Babies with these conditions may not be developmentally ready for solid foods at similar chronological ages as full-term, healthy babies. It is appropriate to issue infant cereal and baby foods only when the baby is developmentally ready. A caregiver of a developmentally delayed baby will need instructions on feeding techniques from the baby's health care provider or a trained professional.

Foods Allergies

A food allergy is an unusual response to a food caused by the body's immune system. The reaction occurs soon after eating the food. The reaction can range from mild to severe. It is estimated that food allergies affect 4% to 8% of children in the United States. Some of the most common foods that cause allergies are listed below, although any food can cause a reaction.

The good news is that food allergies are often outgrown. It is estimated that 80% to 90% of egg, milk, wheat, and soy allergies go away by age 5. Fewer children outgrow allergies like peanuts, other nuts or seafood.

Common Foods that Cause Allergies (potential allergenic foods):

- Dairy, such as cow's milk, cheese, cream, yogurt, butter, sour cream, ice cream, and cottage cheese
- Eggs
- Peanuts
- Nuts from trees, such as cashew, walnut, hazel, etc.
- Fish
- Shellfish, such as shrimp and lobster
- Wheat
- Soy

Reactions to a food allergy can include the following symptoms:

- Hives (red spots that look like mosquito bites)
- Itchy skin rashes (eczema, also called atopic dermatitis)
- Breathing problems, sneezing, congestion, wheezing, or tight throat
- Nausea, vomiting, or diarrhea
- Pale skin, light-headedness, or drop in heart rate

If several areas of the body are affected, the reaction may be severe or even life-threatening. This type of allergic reaction is called **anaphylaxis** and requires immediate medical attention.

Food intolerances or food sensitivities are not the same as food allergies because the immune system is not causing the problem. Lactose intolerance is an example of a food intolerance that is often confused with a food allergy. Those with lactose intolerance have trouble digesting milk sugar, called lactose, leading to stomachaches, bloating and loose stools. Another negative reaction is skin irritation often be caused by acids found in acidic foods, like berries, tomatoes, citrus fruits and vegetables (including citrus juices). These do not usually result in allergic reactions; therefore these foods do not need to be delayed or avoided (however, juice is not recommended for babies).

What May Help Reduce the Likelihood of Food Allergies

Feeding choices can make a difference in a baby's likelihood of developing allergies and a baby's nutrition plays an important role in prevention. Breastfeeding is the best way to feed a baby, and research shows breastfed babies have fewer incidences of allergies, asthma, respiratory illnesses and eczema compared to formula-fed babies. Breast milk is least likely to trigger an allergic reaction; it is easy to digest and strengthens a baby's immune system.

Introducing Potential Allergenic Solid Foods

In the past, it was recommended that common allergenic foods like dairy products (e.g., cheese or yogurt) whole eggs (egg white), peanuts and fish not be introduced until after a baby's first birthday. More recently, evidence has shown that there is no reason to delay introduction of these potential allergenic foods.

Potential allergenic foods can be introduced around 6 months of age, just as other solid foods are introduced. For example, this includes dairy products such as cheese or yogurt (not cow's milk to drink due to nutrition reasons not related to allergies); whole eggs; soy; wheat; peanut and tree nuts in a form of thinned butter or paste (not whole peanuts or tree nuts due to choking risk); and fish and shellfish.

Certain steps are encouraged when introducing potential allergenic foods. Safe ways to instruct caregivers to do this include:

- Potential allergenic foods should only be introduced once several other solid foods have been fed and tolerated.
- Introduce the first taste at home rather than at day care or a restaurant.
- Wait 3 to 5 days before introducing another food.
- Introduce in appropriate ways, as to avoid choking. Dilute creamy smooth peanut or nut butters with breast milk or formula to a thin consistency or mix into prepared infant cereal and offer only a small amount at a time. Chunks of peanut or nut butters pose a choking risk.
- Introduce in safe way, to avoid food-borne illness (e.g. fully cooked eggs and fish)
- If the baby is "at-risk", defined as those with pre-existing allergies or suspected allergies, sibling or first degree relative with an allergy, recommend they discuss introduction of these foods with a health care provider *before* introducing potential allergenic foods.

Awareness of Negative Food Reactions

Once solids are introduced into a baby's diet, only one new food at a time should be given, and the new food should be fed for 3 to 5 days prior to the introduction of another new food. If sensitivity to the food such as skin rash, diarrhea, hives, or vomiting is exhibited, the food can be easily identified and removed from the diet until a later date when the food can be reintroduced.

Infants At-Risk of Food Allergy

There are certain circumstances that place a baby at higher risk of potentially developing a negative reaction to food. Introducing potential allergenic foods should first be discussed with the health care provider for a plan of how to introduce potential allergenic foods. The following are recommendations on when to refer a family to their health care provider:

- If one or both parents or other siblings have an allergic disease, specifically a peanut allergy, the baby is more likely to develop a food allergy or eczema.
- If a baby has persistent moderate-to-severe eczema that is not well managed.
- Babies with one underlying food allergy or history of reacting immediately to a food. Including diagnosis of a milk protein allergy and prescribed a special formula.
- If there is a perception by the caregiver of the baby having a food allergy and, thus, that caregiver is limiting the baby's diet.

For those babies considered not at-risk for the development of food allergies there are no restricted foods except for cow's milk and other "milks" (e.g., soy, almond and goat's milk, etc.) and honey until after one year of age.

Iron Needs During Infancy

Iron is vital throughout life, but is especially important during infancy and childhood when growth is rapid. Iron is a part of red blood cells, and it carries oxygen to all parts of the body. Adequate oxygen is necessary for normal growth.

Healthy full-term babies are born with a supply of iron that will last for about 4 to 6 months. Breast milk contains a perfect form of iron that is well absorbed and used by babies. Iron-fortified infant formula is an excellent source of iron for babies. However, between 4 and 6 months of age the supply is used up and iron must come from iron containing foods in the baby's diet. This is especially true for the mostly breast fed baby.

Iron levels will start to drop if a baby does not get enough iron in the diet around 6 months of age. This can lead to a risk of iron-deficiency anemia.

Recommendations to prevent iron-deficiency anemia starting around 6 months of age:

- Provide plain, iron-fortified infant cereal and/or pureed meat. Pureed meat is especially beneficial for the mostly breast fed baby as it also provides an excellent source of zinc. Just two or more servings a day can meet a baby's iron needs at this age. The suggested amount is approximately 1-2 oz/day meat (or 1-2 small jars of commercially prepared meat/day) or 2 servings/day for cereal (2 tablespoons/servings). Even after other solids have been introduced, iron-fortified infant cereals and/or meats remain a good food source of iron for babies through their first year. Meats should be home prepared or commercially prepared plain and pureed (blended in a food processor or blender until a smooth consistency is obtained).
- The iron in meats is readily absorbed in the body. Iron in non-meat sources, such as cooked dry beans, is not as easily absorbed by the body. To enhance the absorption of iron from non-meat sources, offer a vitamin C- rich food during the same meal to improve iron absorption. For example, iron-fortified infant cereal and vitamin C fortified applesauce.
- Delay low-iron milks (e.g., cow's milk, goat's milk, soy milk) until the baby is at least 12 months old.
- For babies who were born early or small, refer to the health care provider, as iron supplements may be prescribed.
- If a baby can't get two or more servings per day of iron rich foods (such as pureed meats and/or iron-fortified cereal), refer to the health care provider, as iron supplements may be prescribed.

Other solid foods that supply iron for a baby over 6 months of age are:

- Cooked dry beans and peas (e.g. black-eyed peas, chickpeas)–pureed or mashed
- Egg

Poor sources of iron:

- Fruits, most vegetables, and commercial baby food dinners provide very small amounts of iron.
- Cow, goat and soy milk (which should not be fed to babies less than one year of age) are a poor source of iron and can inhibit iron absorption.
- Coffee and tea can inhibit iron absorption and should be discouraged.

Introducing Solid Foods

Solid foods include infant cereal, meat, vegetables, fruits, and other protein-rich foods modified to a texture appropriate for the baby's developmental readiness. Solid foods should be given, along with continued breast milk or formula, in amounts, frequency, and consistency that include a variety of foods to meet the calorie and nutrient needs of the growing baby. Ideally, the choice of solid foods should "complement" or fill in the nutritional gaps that develop as a natural result of the babies growing needs.

First Foods

It is a commonly held belief that foods should be introduced in a certain order. For example, offering vegetables before fruits, because of the belief that babies prefer the sweet flavor of fruits over vegetables. There is no scientific evidence that supports offering foods in a certain order. In other words, a baby is not more likely to accept a new food based on the order in which it was introduced. The order in which foods are introduced should be based on the nutritional needs of the baby.

Whatever the food choice, a baby's first food should be single-ingredient foods (not a combination of foods) that are nutritious and have a smooth texture and thin consistency. While every baby has their own taste preferences, food acceptance can be influenced. For this reason, caregivers should be encouraged to offer foods multiple times (> 10 exposures) to allow opportunities for babies to accept a new food. The pace at which babies accept new tastes and textures varies greatly. Caregivers should be encouraged to respect the pace their baby sets, and they should be reassured that babies who are otherwise healthy will eventually be able and willing to handle a wide variety of texture and tastes.

By tradition, rice cereal was usually introduced first based on the idea that it was less likely to cause an allergic reaction. Newer evidence no longer supports this practice. However, single-grain (rice, barley, oat, wheat) iron-fortified infant cereals are popular first options because they provide iron. Caregivers can adjust the consistency to match the baby's oral-motor skills. Babies, especially those who are mostly breastfed, will benefit from the early introduction of pureed meat. Meats contain sources of iron and zinc that are better absorbed and needed by around 6 months of age when a baby's prenatal iron stores are depleted. For mostly breastfed babies, after 6 months of age, a natural gap exists between the amounts of iron and zinc breast milk provides and the growing needs of the baby. The amount of iron and zinc in breast milk

is not related to the diet of the mother. This need is one reason for starting solids. The food package for fully breast-fed babies provides commercial baby food meats to support the baby's need for iron and zinc (in a form with good absorption). If pureed meat is not introduced starting around 6 months then commercially prepared infant cereal should be served 1 to 2 times daily to meet iron requirements. Although all commercially prepared infant cereal is fortified with iron, zinc fortification of infant cereals may vary and the zinc content of plant foods tends to be low and/or poorly absorbed. The two WIC-approved brands of infant cereal, Beech Nut and Gerber infant cereals are fortified with some zinc. However, introduction of meats around 6 months for mostly breast fed babies is encouraged.

Beyond suggestions that an adequate source of iron and zinc be introduced by 6 months of age, especially for the breast fed baby, The American Academy of Pediatrics recommends the progression of new foods from different food groups (cereals, meats, fruits, vegetables) should continue within the first month of complementary feeding. That means a baby who began eating foods at 6 months could reasonably be eating foods from all food groups by 7 to 8 months of age.

The first feeding:

It is important for a baby to begin good habits early and get used to the process of eating - sitting up, taking food from a spoon, resting between bites, and stopping when full - using the baby's cues as a guide.

Suggestions for the first feeding:

- Offer the first solid food after feeding some breast milk or infant formula. This way, hunger is less of a factor and it is easier to judge the baby's readiness to accept a food. The baby will be less likely to get frustrated if he/she is not overly hungry.
- Start with a small amount (about 1- 2 teaspoons). Allow the baby to lead on how often and how fast to feed.
- Show a positive attitude when introducing food to a baby. If the baby becomes upset or refuses to eat, do not force it, but offer it again at another time. Babies are developing their sense of trust in the world and depend on the caregiver to read their reactions. Babies show their desire for food by drooling, opening their mouths, and leaning forward. On the other hand, they show lack of interest or fullness by leaning back, turning away, pushing the spoon or food away, or closing their mouths.
- Introduce single-ingredient foods one at a time. This will help the caregiver identify negative food reactions. The AAP suggests waiting 3 to 5 days between each new food.
- If using infant cereal, mix dry infant cereals with breast milk or infant formula. Do not mix cereal with water; water does not contain any calories or nutrients. Start with a teaspoon of cereal mixed with the liquid in a small dish to form a very thin cereal. Offer the cereal one or two times a day. As the baby gets used to eating cereal, larger portions can be offered, and the cereal can be made thicker. Serve infant cereal plain, without added sugar or sweeteners.

Modifying Foods to Prevent Choking

Caregivers can greatly reduce the risk of choking by serving food that is the appropriate texture for the baby's development. Such as blending or pureeing food; mashing food with a fork until it is soft and small enough to swallow; or chopping food into bite-sized pieces using a food chopper, food processor, or knife. It's also important to moisten food that's very dry. Suggestions to prevent choking include:

- Supervise when a baby eats and do not leave the baby alone with eating. Always sit the baby in an upright position. Encourage the baby to eat slowly.
- Avoid using teething pain relief medicine before mealtime since it may interfere with chewing and swallowing.
- For younger babies, prepare food so that it is soft and does not require much chewing.
- For the older baby, cut foods into small pieces or thin slices that can easily be chewed.
- Cut round foods such as cooked carrots into short strips rather than round or coin shaped pieces. Raw whole grapes, cherries, berries, melon balls, and grape or cherry tomatoes should be cut into quarters, with pits removed before feeding. Large pieces of food can become lodged in the throat and cause choking.
- Remove hard pits and seeds from vegetables and fruit.
- Substitute foods that may cause choking with a safe substitute:
 - Meat chopped up or mashed ground beef instead of chunks of meat, hot dogs or pieces of tough meat.
 - Cheese shredded, cut into strips or small slices instead of chunks of cheese.
 - Thin creamy peanut or nut butters with breast milk or formula, mix a small amount into prepared infant cereal or place a thin smear on toasted bread or crackers instead of chunks or smeared on soft bread. Too much peanut or nut butters at one time stick to the roof of a baby's mouth and make it difficult to swallow. Do not feed whole or chopped peanuts or other nuts.

Iron-fortified infant cereals:

Iron-fortified single-grain infant cereal is a good choice to include in the baby's daily diet since it provides a source of iron. Infant cereal has additional iron to meet the rapidly growing needs of the baby. It is important to note that the manufacturers of infant cereal add a form of iron to the infant cereals which is better absorbed by the baby's body. Thus, only infant cereals should be given. Iron-fortified cereals not specifically made for babies do not generally contain a form of iron that is easily absorbed by the body. In addition, infant cereals provide a smooth texture and can be varied in thickness to help the baby adjust to the new eating experience. Mixed-grain infant cereals and cereal and fruit combinations may be introduced after a baby has been introduced separately to each food in the mixture or combination.

Dry infant cereals may be less expensive than jars of prepared cereals and they are more nutritious. Jars of prepared cereals are usually mixed with fruit, which makes them higher in calories.

Homemade Cereals

Some caregivers may want to make their own homemade cereal versus buying pre-packaged commercially prepared infant cereal. The reason commercially prepared infant cereals are typically recommended is because they are fortified with iron and in some cases additional nutrients like zinc. Iron and zinc must be obtained from solid foods during late infancy, particularly for breastfed babies. Homemade infant cereal won't be fortified with iron or zinc. Considering that commercial infant cereals serve as the cornerstone of many infant diets, they go a long way towards preventing iron deficiency in babies who don't have the benefit of receiving other good sources of iron. They're also convenient and safe. They're stable to store and easy to mix with breast milk or formula. Of course, if a caregiver chooses to prepare their own homemade cereal ensure the caregiver is aware that the baby needs other sources of iron, especially the mostly breastfed baby, such as pureed meats, beans or eggs 1-2 times daily.

Protein foods:

Chicken, turkey, lamb, and beef, are suggested meats to serve. When a new meat is given it should be a single meat, i.e., strained beef instead of a combination dinner that contains beef.

Eggs are also an excellent source of protein and may be offered to the baby. The egg may be hard cooked or scrambled. To prevent the risk of food-borne illness all eggs should be fully cooked.

Discourage the commercially prepared strained dinners (vegetable/meat combination) because of their low nutrient content. Cooked dried beans and peas (chickpeas, black-eyed peas), tofu, and shredded cheese are good meat substitutes.

After a variety of plain strained meats, vegetables, and fruits have been introduced by 7 to 8 months of age, begin to add more textures with foods, such as minced meats, cooked vegetables, coarsely chopped fruits, shredded cheese, etc. using the baby as a guide to determine the appropriate texture based on their development. Use plain, unseasoned table foods and modify the texture by hand chopping or using an infant food grinder.

Vegetables and fruits:

Commercially prepared (for baby) strained carrots, peas, green beans, sweet potatoes and squash are common vegetables for babies. Canned vegetables not specifically made for babies should be avoided because of the high salt content. Vegetables should be served plain without added fat (margarine, lard, etc.), salt, or sauces. (Remember that an adult's taste preferences are not the same as a baby's. Just because an adult likes salted vegetables doesn't mean that a baby does too!)

When a new vegetable is given, it should be a single vegetable, i.e., strained carrots instead of "peas and carrots."

Suggested fruits to serve that are commercially prepared for babies include strained pears, applesauce, plums, apricots, and peaches. Soft, ripe bananas or unsweetened applesauce are also good fruits for a baby.

Fruits packed in heavy syrup should be avoided because of higher sugar content.

Commercially prepared baby desserts, such as chocolate pudding, peach cobbler, and banana/apple dessert, as well as other desserts, should be discouraged because of their high sugar content.

Fruit juices – limited use:

Fruit juices are not needed, but, if given, should only be offered when a baby can drink from a cup with assistance, which is usually around 7 months of age. Juice should not be given to babies before 6 months of age. Feeding juice from a bottle may lead to tooth decay and an over-consumption of juice. When offering juice use a cup. If cups with lids designed to prevent spilling (i.e., sippy cups) are used, encourage caregivers to not allow their baby or toddler to carry the cup around with them. This practice can lead to excessive consumption of juice. Limit juice intake to no more than two ounces a day. Sippy cups are best used as a temporary training tool to help a baby transition from a bottle to a cup.

When introducing juice, the recommendations to introduce one single-ingredient 100% fruit juice at a time, wait 3 to 5 days between each new food, and watch the baby closely for adverse reactions, still apply. A good first choice would be apple juice fortified with vitamin C. After single ingredient juices have been given, mixed juices can be offered one at a time.

Fruit drinks, artificially colored and flavored drinks, sweetened drinks, sports drinks, tea, "gelatin water," and colas or other sodas, should not be offered to babies.

Some additional points about feeding fruit juices to babies include:

- The American Academy of Pediatrics has concluded that fruit juice offers no nutritional benefit for babies less than 6 months and no benefit over whole fruits for babies older than 6 months. Therefore whole fruits should be encouraged; however, 100 percent fruit juice, in limited quantities, can be part of a well-balanced diet. WIC recommends limiting juice to no more than two ounces a day. Too much juice may give the baby a feeling of fullness and, therefore, other important foods may not be eaten. Too much juice may also cause stomach upset, diarrhea, and tooth decay.
- Citrus juices such as orange juice may cause a rash around the mouth. This is due to irritation from the acid in the food, not necessarily from an allergic reaction. To avoid this type of skin reaction, delay citrus juices until one year. Other types of vitamin C-enriched juices, such as vitamin C-enriched apple juice, may be good choices to start with for young babies.
- Educate caregivers to select only pasteurized juice. Unpasteurized juices should never be given to babies because there is a risk of the baby being exposed to pathogens such

as *Escherichia coli* (E Coli), Salmonella, and Cryptosporidia organisms which can cause serious disease.

- Infant juices are expensive and not necessary. Thus, babies can be offered unsweetened adult juices. Initially recommend that babies be offered juices which have been diluted with equal amounts of water. Once the baby tolerates juices, the dilution may be gradually decreased. Be sure the juices are fortified with vitamin C.
- Imported canned juices are not advised for babies. It is possible that the seams of cans manufactured outside the United States may contain lead which can leach into the food. Cans manufactured in the United States do not contain lead seams.

Appropriate Infant Feeding Practices

Feeding practices influence a baby's health and lifelong eating habits. Any of the following practices can be recommended throughout the baby's first year of life.

It is best to feed babies in a high chair or propped in a safe chair. Another good position is to seat the baby upright on the caregiver's lap. This helps to make the baby feel secure about this new feeding experience. The caregiver and baby should have good eye contact so that they can readily see each other. Always check the baby to make sure the food is being swallowed easily.

Feed solids from a spoon. Spoon-feeding is an important part of developing the ability to self-feed. It also promotes the proper development of tongue muscles that are important for speech and allows the baby to experience the taste and texture of foods. There are several inexpensive feeding utensils especially designed for infant feeding. Long-handled spoons with small shallow bowls and infant cups with handles and weighted bottoms make feeding easier for the baby and caregiver.

This allows the baby to become accustomed to new foods. It will also provide an opportunity for caregivers to readily identify if any one food causes an adverse reaction such as rash, hives, vomiting, diarrhea, or respiratory problems. In the case of an adverse reaction, eliminate the food from the diet and reintroduce at a later date.

Introduce new foods when the baby is in a good mood and hungry, but not overly hungry. Start new foods in small quantities--a teaspoon--and slowly increase to a tablespoon or more. Wait for the baby to open their mouth before trying to feed. Feed as slowly or as fast as the baby wants. Let the baby touch the food.

Let babies set the pace for feeding. Wait until the baby indicates he is ready for another spoonful.

Wash baby food jars before opening. Jar lids should make a popping sound when opened. The popping indicates the product was safely processed and stored. If the "bubble" on the top of the jar has already popped up, the food in that jar should not be fed to the baby.

Do not force new foods that are rejected by a baby, but rather offer them at another time. Babies will generally learn to accept most new foods if they are offered repeatedly. It may take 10-15 exposures to a new food before a baby will accept it.

Caregivers can encourage acceptance of new foods by demonstrating a positive attitude about them. Babies will not necessarily refuse foods that other family members do not like. Babies who are exposed to more foods are more likely to enjoy a greater variety of foods as an adult.

It is not necessary for a baby to finish a bottle or solids. The baby is usually the best judge of how much to eat. Pay attention to their signals. Babies show lack of interest or fullness by leaning back, turning away, pushing the spoon or food away, or closing their mouths. Overfeeding or forcing a baby to eat may lead to an overweight baby or to habits that may eventually cause obesity.

Suggested Meal Pattern

This is a guide for healthy babies. Every baby is different. Babies may consume more or less than these amounts. It's important caregivers understand and look for their baby's cues of hunger and fullness to guide how much to feed. Babies 6 – 8 months old still rely mostly on breast milk or formula to grow and develop.

Age	Baby's Abilities	Foods
Around 6 months of age	<ul style="list-style-type: none"> -Sits up alone or with help- Holds head steady & straight -Opens mouth when sees food coming -Opens mouth for spoon -Keeps tongue low and flat to receive the spoon -Closes lips over spoon & pull food into mouth -Keeps most food in the mouth rather than pushing it back out onto the chin -Turns head away from food when full 	<p><u>Morning Snack:</u> 1-2 tablespoons plain pureed meat or single-grain infant cereal mixed with 4-5 tablespoons of breast milk or formula</p> <p><u>Afternoon Snack:</u> 1-2 tablespoons plain pureed meat or single-grain infant cereal mixed with 4-5 tablespoons of breast milk or formula</p> <p>Start with one new food every 3-5 days. Continue to offer new foods. By 7-8 months of age a baby should be eating foods from all food groups (cereal, protein [pureed meat, mashed beans, egg, tofu], fruit, vegetable). Gradually thicken the consistency.</p> <p>Breastfed babies usually nurse six or more times a day. Formula-fed babies drink about 27 to 32 ounces a day.</p>
7-8 months of age	<ul style="list-style-type: none"> - Sits without help -Starts drinking from a cup with help, expect spills -Moves food from front to back of mouth -Starts to mash food with gums -Clenches mouth shut, turns head away or pushes food away when full 	<p><u>Morning:</u> 2 tablespoons infant cereal mixed with breast milk or formula to desired thicker consistency and 1 tablespoon pureed or fork-mashed fruit</p> <p><u>Afternoon:</u> 2 tablespoons pureed or fork-mashed vegetables or fruit, 2 tablespoons yogurt</p> <p><u>Evening:</u> 2 tablespoons pureed or fork-mashed vegetables, 1-2 tablespoons plain pureed meat or other protein food (mashed beans, egg, tofu), and 2 tablespoons prepared infant cereal</p> <p>Breastfed babies usually nurse six or more times a day. Formula-fed babies drink about 27 to 32 ounces a day.</p> <p>Vary the texture. Try new foods spaced every 3-5 days. Like mashed cooked eggs, beans, tofu, shredded cheese, thinned peanut or nut butters added to cereal.</p>

SELF-CHECK: PRACTICE YOUR KNOWLEDGE

1. Fill in the blanks to complete the sentences accurately.
 - a. Most babies are ready to being eating solid foods around _____ months of age.
 - b. An baby's nutritional needs can be entirely met by _____ or _____ from birth to 6 months of age.
2. Which of the following statements are indicators of a 6 month old baby's readiness to start the introduction of solid foods? (Circle the letters.)
 - a. Ability to sleep through the night.
 - b. Ability to keep the tongue low and flat to receive the spoon.
 - c. Ability of the baby to sit up alone or with support.
 - d. The baby has at least 2 teeth.
 - e. Ability to keep food in the mouth and swallow it rather than pushing it back out onto the chin.
3. Circle the foods that would be most appropriate for a 7-month-old baby.

Iron-fortified infant cereal	Strained fruit	Strained beef
Banana/apple dessert	Chunks of meat	Orange juice
Strained vegetable	Egg	Chicken noodle dinner (from a jar)
4. Circle the items that are good sources of iron for the baby:

Iron-fortified formula	Fortified infant cereal
Breast milk	Strained meats
Fresh whole milk	Mashed cooked dry beans
Strained fruits	Tea
5. Fill in the blank to accurately complete the statement.

Feeding a vitamin _____-enriched food at the same time that the iron-rich food is fed can increase absorption of iron by the body.
6. True (T) or False (F)?

_____	a. Babies need juice to meet their nutritional needs.
_____	b. Introduce new foods to babies when they aren't overly hungry and are in a good mood.
_____	c. Forcing an baby to eat may lead to habits that may cause obesity later in life.

ANSWERS

1.
 - a. 6 months of age.
 - b. breast milk
iron-fortified infant formula.
2. b, c, e
3. Iron-fortified infant cereal
Strained vegetable
Strained fruit
Egg
Strained beef
4. Iron-fortified formula, breast milk, fortified infant cereal, strained meats, mashed cooked dry beans.
5. Vitamin C
6.
 - a. False
 - b. True
 - c. True

Special Consideration for Preterm Infants

Term babies are born with large iron stores, related to gestational age (the age of the baby at birth), birth weight or size, which meet their needs until 4 – 6 months of age. Preterm and low birth weight babies are born with much less stored iron and experience rapid growth in the first few months of life. Thus, their iron stores are used up much sooner than the iron stores of term babies (often by 2 – 3 months of age). Likewise, due to rapid growth, preterm babies have a much greater zinc requirement than term babies. Babies born preterm, with low birth weight, facing rapid growth and those with some medical conditions may benefit from an added source of iron and zinc before 6 months of age. Encourage WIC mothers of medically fragile babies to discuss their baby's individualized needs with their health care provider.

Dental Health

The primary or "baby" teeth begin to form in the jaw before birth and continue to develop throughout the first years of life. Good nutrition during pregnancy and infancy helps to form teeth that are strong and healthy. Breastfeeding also helps by promoting optimal jaw and tooth development. A breastfed child is less likely to have crooked teeth, with the risk decreasing the longer a child is breastfed.

Several nutrients are necessary for the development of healthy teeth, but the most important ones are **protein, calcium, phosphorus, and fluoride**. Many communities add fluoride to the water supply if it is not present naturally. *The American Academy of Pediatrics and the American Dental Association recommend fluoride supplements for infants starting at 6 months of age if the water supply does not have adequate fluoride.* Refer caregivers to their local water treatment plant to learn if the community water supply has adequate fluoride. Caregivers can also be given the telephone number of the Colorado Oral Health Program, at the Colorado Department of Public Health & Environment to receive the above information.

If prescribed by a health care provider, fluoride supplements can be given by mouth from a dropper, or drops can be added to the baby's drinking water, infant formula, or juice. Caregivers should give only the amount of fluoride prescribed. Too much fluoride over a period of time can cause staining of the teeth called **mottling**.

Early Childhood Caries (cavities)

Early Childhood Caries are caused by bacteria called *Streptococcus mutans*. People who do not take care of their teeth have a large amount of this

bacteria in their mouths and are more likely to spread it to others. Babies do not have the bacteria when they are born, but they can get it from others. The presence of this bacteria, combined with improper feeding practices such as allowing babies to be put to bed with a bottle of infant formula, milk, juice, or sweetened drink increases the chances that early childhood caries will occur.

Caries = Cavities = Tooth Decay

Streptococcus mutans are spread by sharing eating utensils; putting things from an adult's mouth into the baby's mouth (such as the pacifier being "cleaned" in the caregiver's mouth first or pre-chewing foods for the baby). These practices should be discouraged.

Sugar is a natural ingredient in all milks including breast milk and infant formula. Juices, Kool-Aid, and other drinks also contain natural or added sugars. The sugar in these liquids is used by the *Streptococcus mutans* bacteria in the baby's mouth and acid is formed. The acid attacks the teeth causing decay. The upper front teeth are usually the most affected in babies and these sometimes fall out or need to be pulled or capped when decay is excessive.

Early childhood caries are not only painful and unattractive, but also cause problems later on, such as crooked permanent teeth, and speech problems, such as lisping.

Care of the Gums and Teeth

The primary teeth usually begin to appear near the age of six months and are subject to decay from the time they first appear. Therefore, care of the gums and teeth should begin in the first months of life.

Preventing Early Childhood Caries

- Good dental health, including daily cleaning of the gums and teeth, should be started early in life. Even before the teeth appear, caregivers can clean the baby's gums with a clean cloth or gauze. This removes residues from the mouth and gets babies used to having their mouth cleaned.
- When teeth do appear, caregivers should begin brushing baby's teeth as soon as they begin to come into the mouth by using fluoride toothpaste in an amount no more than a smear or the size of a grain of rice. Brush teeth thoroughly twice per day (morning and night) or as directed by a dentist or physician. Do not share eating utensils and toothbrushes among family members.
- Discourage the practice of caregivers chewing the food to be given to the baby to prevent the transfer of *Streptococcus mutans* from the adult's mouth to the baby's.
- Babies should never be put to bed with a bottle of infant formula, milk, juice, or sweet drink. Encourage caregivers to hold their babies when feeding them and to teach them to fall asleep without a bottle.
- Do not permit walking toddlers to carry around a bottle or spill-proof cup that is filled with juice, etc., throughout the day.
- Begin weaning from bottle to cup near 7 months of age. Breastfed babies can be introduced to a cup at this time and may never need a bottle. Complete weaning from the bottle near the time of the first birthday. As weaning occurs, formula or breast milk can be offered in the cup.
- Never dip pacifiers in honey, sugar, or syrup.

For more information on oral health, click on the link below to access the AAP Pediatric Guide to Oral Health Flip Chart and Reference Guide produced by The American Academy of Pediatrics (Section on Oral Health). The PowerPoint presentation provides up-to-date information on oral health issues such as breastfeeding and bottlefeeding, use of sippy cups, non-nutritive sucking, fluoride supplementation and tooth brushing.

[Pediatric Guide to Oral Health PowerPoint Presentation \(English\)](#) *New!*

This presentation is also available as a [flip chart](#).

All materials can be found at:

<http://www2.aap.org/oralhealth/PediatricGuides.html>

Common Concerns in Infancy

Certain gastrointestinal disturbances are commonly reported by caregivers of babies. These include constipation, diarrhea, spitting up, and colic. When caregivers complain of these problems WIC staff need to assess whether it is a chronic problem, a one-time problem, and whether the caregiver understands what is "normal."

Constipation

Many caregivers become concerned if their babies do not have daily bowel movements. Although many babies have a daily stool, others may only have a stool every 2 to 3 days. The older breastfed baby (over 2 months of age) as well as formula-fed baby may have infrequent stools. Frequency is not a good indicator of constipation.

Caregivers may also worry that straining is a sign of constipation, but this is normal for babies as their muscles and digestive tracts develop. Constipation in babies is better characterized by hard, dry stools that are difficult to pass.

Constipation in babies may result from a variety of factors or conditions, including:

- Inadequate breast milk, infant formula, complementary foods or fluid intake
- Improper dilution of infant formula
- Early introduction of complementary foods
- Excessive cow's milk intake in older babies
- Excessive fluid losses due to vomiting or fever
- Lack of movement or activity
- Use of certain medications
- Underlying medical conditions or physical abnormalities

The amount of iron supplied by iron-fortified infant formula does not cause constipation.

If a caregiver reports that the baby is constipated, ask him or her to describe the baby's symptoms.

If the symptoms do not fit the definition of constipation:

- Provide education about how “normal” babies can have very different bowel patterns.
- Suggest increasing breast milk or formula intake, if appropriate
- Encourage mobility (i.e., allow baby to lie on a blanket and kick legs in the air, or roll around).

If the symptoms do fit the definition for constipation:

- Refer the baby to a health care provider for medical evaluation
- Assess the baby's feeding practices for adequacy of breast milk or infant formula intake, formula preparation and dilution, appropriate types and amounts of complementary foods, and early introduction of complementary foods.
- For babies older than 6 months, offer up to 4 ounces per day of full strength 100% fruit juice such as apple, pear or prune for 2-3 days until a normal bowel movement occurs and not consistently.
- Once a baby is taking solids try vegetables and fruits, such as prunes.

Diarrhea

Diarrhea is defined as the passage of frequent, loose, unformed, or watery stools. Diarrhea is difficult to define, however, because each baby has his own pattern of bowel movements, and what is normal for one baby may not be normal for another.

For example, breastfed babies may normally have loose, frequent stools. This is not a matter of concern. However, if the stools become green or black (after the first few days of life), explosive, and foul smelling, then there is cause for concern.

Persistent diarrhea can be dangerous. Caregivers of babies with true diarrhea should be referred to their health care provider for treatment to prevent dehydration and other serious complications in the baby. Use of sports drinks, such as Gatorade, is not recommended for hydrating babies.

Spitting Up

Spitting up should be differentiated from vomiting. Spitting up involves small amounts of milk that are spilled from the mouth, as opposed to forcefully ejected out of the mouth. This may occur several times a day during or shortly after feeding. It can occur with jostling, squeezing, or even just laying the baby down. Spitting up is harmless if the baby is growing well and content.

Occasionally, a change in feeding techniques will alleviate the problem. Techniques to reduce excessive spitting up include the following:

- Burp the baby several times during a feeding. Burping is generally done during normal breaks in a feeding; it slows a feeding and can lessen the amount of air swallowed.
- After feeding hold the baby in an upright position for about 15 to 30 minutes.
- Avoid excessive movement or play right after eating.
- Avoid forcing the baby to eat or drink when full and satisfied (encourage caregivers to watch for signs of satiety).

Refer the participant to their health care provider if a formula change is requested. Forceful and persistent vomiting may be a symptom of a more serious illness.

Colic

The cause of colic is unknown. Researchers have explored a number of possibilities, including allergies, lactose intolerance, maternal anxiety, changes in the digestive system, and differences in the way a baby is fed. Yet it's still unclear why some babies have colic and others don't. Colic usually develops between 2 to 6 weeks of age and may continue until the baby is 3 to 4 months old, sometimes lasting until 6 months of age. Babies with colic will frequently show discomfort and aggravated behavior such as screaming, drawing their legs onto the abdomens, passing gas, and inconsolable crying. It may occur at similar times every day, such as in the evening. Many babies, no matter whether they are formula-fed or breastfed, have a regular fussy time, usually in the late afternoon or early evening.

Formula-fed babies seem to experience colic more than breastfed babies. Some evidence indicates that colic in breastfed babies' is a sign of sensitivity to a food in the mother's diet. Mother's can try to eliminate milk products, caffeine, onions, cabbage, and any other potentially irritating foods from their diet. If food sensitivity is causing the discomfort, the colic should decrease within a few days of these changes. For formula fed babies, some benefit has been shown with the use of hypoallergenic infant formula.

The psychological stress and harm to the caregiver-child relationship is of concern when a baby has colic. Caregivers need support and assurance throughout these difficult months. Helping caregivers develop skills to respond to their babies' needs may enhance caregiver ability to care for their baby.

Concerns about colic should be investigated by a health care provider to rule out any medical conditions. There is no clearly effective treatment to manage colic. Once medical conditions have been ruled out, the following suggestions may provide some help:

- Burp the baby if needed
- Change the diaper if needed
- Soothe the baby by swaddling him in a blanket, rocking him to music
- Carry him in a carrier
- Lay him tummy down on the bed and pat his back until he has calmed down (it is not recommended that newborn babies be put to sleep on their stomachs)
- Use repetition to soothe (repeat the same action over and over again before trying something new)

If the baby cries excessively, encourage the caregiver to identify someone they can contact if they feel they may lose control. Empathize with caregivers to understand the frustration of not being able to soothe one's baby. Remind caregivers that it is okay when frustrated or overwhelmed to simply place the baby in a safe place, such as their crib, and walk away to calm down and to *never* shake a baby.

SELF-CHECK: PRACTICE YOUR KNOWLEDGE

1. Fill in the blanks:
 - a. The four most important nutrients for healthy teeth are:

 - b. The American Academy of Pediatrics and the American Dental Association recommend that a supplement of _____ be given to babies six months old and older if the water supply does not have adequate amounts of it.
 - c. Early childhood caries are caused by a bacteria called _____
2. List one way the bacteria that causes dental caries is spread:
3. True (T) or False (F)?
 - a. _____ Babies put to bed with a bottle of formula, milk, or juice can develop tooth decay.
 - b. _____ Good dental health practices begin early in life, even before babies have teeth.
 - c. _____ It is acceptable to dilute formula for 2-3 days for babies with constipation.
4. List four feeding techniques to reduce excessive spitting up.
 - a.
 - b.
 - c.
 - d.
5. List three suggestions for a caregiver of a colicky baby.
 - a.
 - b.
 - c.

ANSWERS

1.
 - a. Protein, Calcium, Phosphorous, Fluoride
 - b. Fluoride
 - c. *Streptococcus mutans*
2. Either of the following:
Sharing eating utensils
Putting objects in an adult's mouth then into the baby's mouth (pre-chewed foods, pacifier)
3.
 - a. True
 - b. True
 - c. False; never dilute formula.
4.
 - a. Burp the baby several times during a feeding
 - b. After feeding hold the baby in an upright position for about 15 to 30 minutes
 - c. Avoid excessive movement or play right after eating
 - d. Avoid forcing the baby to eat or drink when full and satisfied
5. Any three of the following:
 - a. Burp if needed
 - b. Change diaper if needed
 - c. Sooth by swaddling in a blanket
 - d. Rocking
 - e. Carry in a baby carrier
 - f. Lay baby tummy down on the bed and pat his back
 - g. Use repetition to soothe

Nutrition for the Older Infant: 8 to 12 Months of Age

Changing from strained or pureed foods to foods with more texture is an important part of developing the skills to learn to eat independently. In WIC, issuance of fresh fruits and vegetables in lieu of some jarred baby food fruits and vegetables can be given as an option when the baby is 9 months old. This food package option should be discussed with the endorser to determine if the baby is developmentally ready to consume foods of increased texture and consistency. The computer system will not automatically change the food package.

Finger Foods

When the baby shows signs of being able to chew with up and down movement, and can move the tongue from side to side and swallow, **finger foods** should be offered. This is usually at 7 or 8 months of age.

Finger foods are small pieces of soft food that can be easily dissolved in the throat or dislodged if they become stuck. They are called finger foods because they allow babies to practice using their hands and fingers to feed themselves. Examples of good choices for finger foods include: soft, peeled fruit; cooked vegetables; mild cheese; toast pieces; tortillas, crackers; and small pieces of tender meat.

Food in small, round, or hard pieces that can become lodged in the baby's throat or that can "ball up" in the baby's throat should not be given. Examples of such foods are nuts, popcorn, raisins, raw vegetables, grapes, cherries, hot dogs or meat sticks (whole or coined shaped cut pieces), and peanut butter on soft bread.

Self-Feeding Skills

Many babies around 9 months prefer to feed themselves with their hands and fingers rather than with utensils. This is their way of experimenting with food. It is important that babies be allowed to take part in this activity, even though it is messy, because it is an important part of learning to feed themselves.

Near the age of one year, babies become interested in holding utensils and feeding themselves. They enjoy playing with spoons during meal- or play-time. This is a good way for them to begin to learn to use a spoon. Babies gradually learn to get food on the spoon and the spoon to their mouth, although food is often spilled before it gets into their mouth.

Some suggestions that WIC staff can offer to caregivers of babies who are learning to feed themselves include:

- Make mealtime happy and calm. Smile and talk to the baby.
- Be patient with the baby during this learning period.
- Pick a time or times of the day to allow the baby to "play" with his food.

- Cover the floor under the baby's chair with paper or an old shower curtain and dress the baby in clothing that will not be harmed by spilled food.
- Include foods which are fed to the baby, as well as items that the baby can feed him/herself at meals.
- Give the baby small portions of food.
- Avoid spicy foods. Babies also do not need added butter, salt, or sugar.
- Let the baby use a cup with all meals.
- Stay with the baby when he/she eats so that it is a social experience and to be there should he/she gag or choke.

Each baby develops at his own rate. There is no specific age at which a baby should be able to feed himself, although full-term babies should be trying to finger feed themselves by seven months of age. The process of learning to eat independently continues into the second year of life.

Meal Planning

A baby who is 8 months to 12 months of age should be eating many types of solid foods with a variety of textures and colors. Finger foods should be included at meals and snack time. The daily diet should include foods from all of the food groups. Encourage caregivers to offer solid foods following a schedule that considers the baby's appetite and the family's schedule. Smaller babies and babies at the lower end of the age range require smaller portion sizes than older, larger babies. Offer breast milk or formula in a cup.

Developing Healthy Eating Habits

The following are some tips to pass along to participants about feeding habits and how all this information relates to their babies' attitudes toward eating:

- Lifelong eating habits are formed in infancy and childhood and early positive experiences with foods can encourage acceptance of them later in life.
- It takes time to learn to enjoy some foods. Caregivers should keep offering a food so it becomes familiar to the baby and child.
- Allow babies and children to develop their own food likes and dislikes. Caregivers can serve as good examples for their children by eating a variety of healthy foods and being open to trying new foods themselves.
- The habits of eating sugar, salt, and fat begin early in life for many people. These habits can be harmful if learned while young and continued throughout life. Thus, caregivers should limit less-nutrient-dense foods such as potato chips, soft drinks, and desserts.
- The family's mealtime is an important time for children to learn good eating habits. Have the baby take part in the family's mealtime. Perhaps feed the baby earlier and give him finger foods while the rest of the family eats.
- Caregivers are responsible for presenting appropriate food in a supportive fashion. The baby should be allowed to make the choice about how much to eat. If a baby is pressured to eat, feeding problems can occur.

Suggested Meal Pattern

Older babies need more food. As a baby begins to eat more solid food, their need for breast milk or formula will decrease. By 8 to 12 months of age babies should be eating a wide variety of food with different textures, including some table foods. Again, this suggestion is only a guide; babies may eat more or less than these amounts.

Age	Babies Abilities	Foods
8 to 12 months	<ul style="list-style-type: none"> -Starts to pick up food with fingers -Drinks from a cup with less spilling -Moves food to sides of mouth and chews - Continues practice of drinking from a cup -Picks up food and puts in mouth 	<p><u>Morning:</u> 4-6 tablespoons prepared infant cereal, 2-4 tablespoons diced soft fruit</p> <p><u>Mid-Morning Snack:</u> 2 ounces water in a cup, 2-4 tablespoons yogurt, 2-4 tablespoons diced soft fruit</p> <p><u>Afternoon:</u> 2-4 tablespoons cooked mashed beans (egg or tofu), 2-4 tablespoons cooked vegetables</p> <p><u>Mid-Afternoon Snack:</u> Whole grain toast strips, add a thin smear of smooth peanut or nut butter) or top with fork mashed fruit, 2 ounces water in a cup</p> <p><u>Evening:</u> 2-4 tablespoons minced moist meat, 2-4 tablespoons cooked vegetables, 2-4 tablespoons fruit, 2 tablespoons cooked whole wheat pasta or brown rice</p> <p>At this age, breastfed babies usually nurse four or more times a day. Formula-fed babies drink about 24-28 ounces a day.</p> <p>*wipe gums ,brush teeth with a smear (about the size of grain of rice) of fluoride toothpaste) afterward</p>

Figure 1: Sequence of Development and Feeding Skills in Healthy, Full-Term Infants

Infant's Approximate Age	Mouth Patterns	Hand and Body Skills	Feeding Skills or Abilities	Hunger and Satiety (Fullness) Cues
Birth through 5 months	<ul style="list-style-type: none"> Suck/swallow reflex Tongue thrust reflex Rooting reflex Gag reflex 	<ul style="list-style-type: none"> Poor control of head, neck, trunk Needs head support Brings hands to mouth around 3 months 	<ul style="list-style-type: none"> Swallows liquids but pushes most solid objects from the mouth Coordinates suck-swallow-breathe while breast or bottle feeding Moves tongue forward and back to suck 	<p>Hunger cues:</p> <ul style="list-style-type: none"> Wakes and tosses Sucks on fist Cries or fusses Opens mouth while feeding to indicate wanting more <p>Satiety cues:</p> <ul style="list-style-type: none"> Seals lips together Turns head away Decreases or stops sucking Spits out the nipple or falls asleep when full
4 months through 6 months	<ul style="list-style-type: none"> Up-and-down munching movement Transfers food from front to back of tongue to swallow Draws in upper or lower lip as spoon is removed from mouth Tongue thrust and rooting reflexes begin to disappear Gag reflex diminishes Opens mouth when sees spoon approaching 	<ul style="list-style-type: none"> Sits with support Good head control Uses whole hand to grasp objects (palmer grasp) Recognizes spoon and holds mouth open as spoon approaches 	<ul style="list-style-type: none"> Takes in a spoonful of pureed or strained food and swallows without choking Drinks small amounts from cup when held by another person, with spilling 	<p>Hunger cues:</p> <ul style="list-style-type: none"> Cries or fusses Smiles, gazes at caregiver, or coos during feeding to indicate wanting more Moves head toward spoon or tries to swipe food towards mouth <p>Satiety cues:</p> <ul style="list-style-type: none"> Decreases rate of sucking or stops sucking when full Spits out the nipple Turns head away May be distracted or pay attention to surroundings more
5 months through 9 months	<ul style="list-style-type: none"> Begins to control the position of food in the mouth Up-and-down munching movement Positions food between jaws for chewing 	<ul style="list-style-type: none"> Begins to sit alone unsupported Follows food with eyes Transfers food from one hand to the other Tries to grasp foods such as toast, crackers, and teething biscuits with all fingers and pull them into the palm. 	<ul style="list-style-type: none"> Begins to eat mashed foods Eats from a spoon easily Drinks from a cup with some spilling Begins to feed self with hands 	<p>Hunger cues:</p> <ul style="list-style-type: none"> Reaches for spoon or food Points to food <p>Satiety cues:</p> <ul style="list-style-type: none"> Eating slows down Clenches mouth shut or pushes food away

Home-Prepared Baby Foods

Home-prepared baby foods are a nutritious, inexpensive way to feed a baby. However, care must be taken during the preparation and storage of the food to prevent contamination. The following are guidelines to discuss with caregivers:

- The preparer's hands should be washed in hot, soapy water. All equipment used in the preparation and storage should be thoroughly washed and rinsed.
- Wash fruits and vegetables; and remove skin, pits, and seeds. Boil and steam the vegetables or fruits in a small amount of water to preserve the nutrients. The fruits or vegetables can then be mashed with a fork or put in a blender or food grinder. If liquid is needed in the preparation, use water, breast milk, or formula only.
- Meats should be trimmed and then baked, broiled, or boiled in a small amount of water. The meat can then be put in a blender or food grinder or slowly cooked in a crock pot. . Meat should be fully cooked.
- There is no need to add salt, sugar, fat, or seasonings to foods prepared for the baby. Discourage canned vegetables because of their high sodium content. Recommend use of fruits packed in their own juices instead of those canned in heavy syrup. Suggest to caregivers that luncheon meats, hot dogs, bacon, and sausage be offered sparingly, if at all, because of sodium nitrate, salt, and high fat contents.
- Spoons used to "taste test" foods should not be put back into the food.
- If the food is not to be eaten immediately after it is prepared, it must be properly stored. Home-prepared foods can be stored in a refrigerator for up to 48 hours.
- Foods can be stored in a freezer for one month. To store single servings for the freezer, the food can be frozen in clean ice cube trays or muffin liners and covered with aluminum foil. Once frozen, the food can be removed from the tray and stored in plastic bags or containers, or glass jars. The frozen foods can be placed in a pan or dish and thawed in the refrigerator or warmed in an oven or pan of water on the stove. Any thawed, heated food that is not eaten should be thrown away.
- Do not feed home-prepared spinach, beets, turnips, carrots, or collard greens to babies less than 6 months of age, as these may contain large amounts of nitrates which could make them sick. Examples of home-prepared vegetables may include sweet potatoes, beans, and green peas.

Using Commercially Prepared Foods

Some caregivers will prefer the convenience of purchasing baby foods from the store. Help caregivers to understand that there will be a point in time when the baby will also be ready for table foods that are easy to chew and safe to swallow, such as rice and pasta. Around one year of age, babies should be able to eat what their caregivers eat – only the size of the pieces of food may need to be modified.

For caregivers who purchase jarred baby food, encourage them to not feed the baby directly from the baby food jar. Instead, food should be placed into a clean dish before it is served to the baby, and food that is leftover in that dish should be discarded. The reason is if the baby is

fed directly from the baby food jar or if leftover food is returned to the jar, the baby's saliva will enter the food. Enzymes in the saliva cause the food to break down and become watery. In addition, the saliva contains bacteria which can cause the food to spoil. If the baby was not fed directly from the jar, any uncontaminated food left over in the jar can be tightly resealed and stored in the refrigerator for up to 48 hours.

Microwave ovens should not be used to warm baby foods, whether left in the jar or placed in another container. The unevenness in the consistency of the baby foods causes the more liquid or watery parts to heat up faster in the microwave than the thicker or more solid parts. This can allow pockets of steam to occur leading to scalds from splattered foods or exploding jars.

Weaning

Weaning from the breast or bottle to a cup is a gradual process. Learning to drink from a cup should begin when the baby is able to sit up without support and is eating solid foods. Babies can usually start drinking from a cup at 7 months of age and bottle-fed babies should be completely weaned from the bottle near the time of the first birthday. Waiting too long to wean makes it harder on both the baby and the family. Normal, healthy babies should not use bottles after fourteen months of age.

Weaning From the Bottle

When beginning the process, instruct the caregiver to choose a feeding in which the baby is least interested (such as the late afternoon feeding) and introduce a cup in its place. Encourage the caregiver to offer assistance in holding the cup for the early weeks of weaning.

At first, the baby will not consume the same quantities of expressed breast milk or formula from a cup as from a bottle. The caregiver should continue with the cup at this feeding for a week or two before another cup feeding is added.

The weaning process should continue gradually until the baby is entirely weaned from the bottle. The bedtime bottle and early morning bottle may be the most difficult to discontinue. This is a time when the baby is tired and more apt to not want his routine changed. The bottle is often a source of security. To help the baby feel secure, have on-hand a favorite toy or blanket when the bottle is being used, so that when the bottle is removed, the baby has the favorite item.

Weaning From the Breast

The decision to wean the breastfed baby from the breast to the bottle or cup is an individual one and should be left up to the mother.

For mothers who decide to wean their baby from the breast before their baby is one year old, WIC staff can encourage mothers of older babies (aged 7 months or older) to wean to a cup, while younger babies may need to be weaned to a bottle. WIC staff should dialogue with mothers about breastfeeding to make sure they are deciding to wean based on correct information.

Recommend that weaning be done slowly and gradually. Weaning is usually accomplished by stopping one nursing at a time. It is suggested that the first feeding to stop be the one in which the baby is least interested, such as the late afternoon feeding. The mother then substitutes a bottle or cup of breast milk or iron-fortified formula for this feeding. The mother or caregiver should continue to use a bottle or cup at this feeding for 5 to 7 days before another nursing is stopped. During this time give the baby extra cuddling and attention so that weaning does not mean separation from the mother. Continue to hold and cuddle the baby during the feeding as you would at the breast. The procedure should continue gradually until the baby is entirely weaned from the breast. The weaning process will result in a gradual decrease in the breast milk supply with little or no discomfort to the mother. If the mother should experience some engorgement, she should be instructed to hand express enough milk to relieve the discomfort.

Counseling Tips for Caregivers about Weaning

- Between 7 and 12 months, babies are developmentally ready and usually interested in learning to drink from a cup. Delaying the change to a cup during this period can result in a refusal to change at an older age. At about 6 months of age, allow the baby to play with an empty cup.
- When liquids are first introduced from the cup, the baby's lips may not close around the edge of the cup and liquids will leak. At first it may be helpful for the caregiver to hold the cup.
- When starting cup feedings, give small amounts of water, breast milk, or formula. *Sweetened beverages should not be given to babies and if juice is provided limit to 1-2 ounces a day.*
- Some babies do not want to give up breast or bottle-feeding or are unwilling to drink from a cup. The weaning process often requires much patience from the caregivers. All caregivers should work together and agree about the weaning process.
- Babies who use the bottle after one year of age may drink too much milk and not eat enough solids which provide iron and other important nutrients. Inadequate iron can lead to anemia. At one year of age, children should be drinking approximately 16 ounces of milk/breast milk daily.
- Continuous sips of milk from a bottle or spill-proof cup can cause tooth decay. Discourage the practice of allowing toddlers to use the bottle without restriction (e.g., walking around with a bottle).
- For babies who are bottle fed, the bottle given before a nap or bedtime is often the most difficult one to discontinue. This bottle can also be the most harmful to the teeth if it is filled with a sugar containing beverages (breast milk, formula, juice) and the baby takes it to bed.

Some suggestions for helping a baby give up the bedtime bottle include:

- Interest the baby in something other than the bottle at bedtime — a stuffed toy, blanket, etc.
- Provide lots of affection and attention instead of a bottle at bedtime.
- Offer a small snack or beverage from a cup near bedtime.
- Put a small amount of water in the bottle instead of milk.

Bottles are not recommended after 14 months of age. The transition might go more smoothly if during the last weeks of bottle use, the child has had an opportunity to bond to a blanket, stuffed animal or book, so when bottle is taken “cold turkey” the child still has a security item.

SELF-CHECK: PRACTICE YOUR KNOWLEDGE

Place a check mark next to each phrase which correctly completes the statement (may be multiple answers):

1. Finger foods should be offered:
 - ☐ a. when the baby starts to walk alone.
 - ☐ b. when the baby sleeps through the night.
 - ☐ c. when the baby can chew with up and down movements.
 - ☐ d. when the baby can move his/her tongue from side to side.
 - ☐ e. around 7 or 8 months of age.

2. Place a check mark next to the following choices of finger foods that are appropriate for an older baby (8-12 months).
 - ☐ a. soft, peeled fruit
 - ☐ b. whole grapes
 - ☐ c. toast pieces
 - ☐ d. crackers
 - ☐ e. popcorn
 - ☐ f. peanut butter on soft bread

3. True (T) or False (F)?:
 - ☐ a. Many babies prefer to feed themselves with their hands and fingers rather than with utensils.
 - ☐ b. Babies who are learning to feed themselves should be served large portions of food.
 - ☐ c. All developmentally normal babies should be able to feed themselves by 9 months of age.
 - ☐ d. Babies 8 to 12 months of age should be eating many types of solid foods with a variety of textures and colors.
 - ☐ e. Lifelong eating habits are formed in childhood.

4. Place a check mark in the blank next to all the statements that are true.
 - ☐ a. Weaning to a cup from the breast or bottle is a gradual process.
 - ☐ b. Weaning to a cup should begin when a baby can sit up without support and is eating solid foods.
 - ☐ c. Babies need help holding the cup for the early weeks of cup feeding.
 - ☐ d. There is no harm to putting the baby to bed with a bottle.
 - ☐ e. Babies who drink from the bottle after one year of age may drink too much milk and not eat enough solid foods.
 - ☐ f. Continuous sips of milk from a bottle or spill-proof cup can cause tooth decay.

5. Circle the letter of the two choices that accurately complete the following statement.
Home-prepared foods for babies:
- a. Can be exactly the same foods that are prepared for the rest of the family with the added salt, sugar, etc.
 - b. Can be stored in a freezer indefinitely
 - c. Are generally less expensive.
 - d. Can be reheated over and over.
 - e. Must be prepared and stored with care to prevent contamination of the food.
6. Circle those foods that should never be given to babies because they can cause choking.
- | | | |
|--------------------|----------------|-------------|
| Raisins | Whole hot dogs | Apple juice |
| Soft, ripe bananas | Whole grapes | Popcorn |

ANSWERS

- 1. c, d, and e should be checked.
- 2. a, c, and d should be checked.
- 3.
 - a. True
 - b. False
 - c. True
 - d. True
 - e. True
- 4. a, b, c, e and f should be checked
- 5. c, e
- 6. raisins, whole hot dogs, whole grapes, popcorn

Section II: WIC Program Infant Nutrition Risk Factors

As discussed throughout this module, adequate nutrition during infancy is very important for long-term growth and health. All babies enrolled in WIC receive a nutritional assessment and follow-up care. Some babies will need special nutrition counseling because of certain factors related to their health. These are called nutrition risk factors (NRFs). Nutrition risk factors affect a baby's nutritional needs and his/her food intake.

A baby with a nutritional risk has an increased chance of poor growth and development. Therefore, it is extremely important that we understand the nutritional risks of infancy and how to identify them.

There are some babies who are identified as high risk. These babies have a more serious nutritional risk than the others. An example of this is a baby who is not gaining sufficient weight. Caregivers of high-risk babies need in-depth nutrition counseling and education. All high-risk participants must be referred to the WIC High Risk Counselor and counseled within 30 days of being identified as high risk. Exceptions to the 30-day time frame include some higher risk conditions that must be referred and seen within 24 hours, and children risked as overweight who must be seen within 90 days of risk identification.

The WIC High Risk Counselor may also counsel other participants, who are not classified as high risk, but would benefit from the High Risk Counselor's in-depth assessment, nutrition counseling and education. As with high risk participants, in those situations the WIC High Risk Counselor develops a care plan for the WIC educator to follow with ideas to provide to the caregiver.

There are many nutrition risk factors (NRFs) that will qualify babies for the WIC Program. This section of the module will define and discuss these factors. The first ones to be covered are those related to inappropriate nutrition practices for babies.

Inappropriate Nutrition Practices for Infants

NRF: 411a (Low Risk): Routinely using a substitute(s) for human milk or for FDA-approved iron-fortified formula as the primary nutrient source during the first year of life.

Examples include:

- Low-iron formula without iron supplementation
- Cow's milk, goat's milk, or sheep's milk (whole, reduced fat, low-fat, skim), powdered, canned evaporated or sweetened condensed milk
- Imitation or substitute milks (such as rice, almond, or soy-based beverages, non-dairy creamer), or other "homemade concoctions."

During the first year of life, breastfeeding is the preferred method of baby feeding. The American Academy of Pediatrics (AAP) recommends breast milk for the first 12 months of life because of its acknowledged benefits to baby nutrition, gastrointestinal function, immunity and psychological well-being.

For babies fed infant formula, iron-fortified formula is generally recommended as the substitute for breastfeeding. Rapid growth and increased physical activity significantly increase the need for iron and utilizes iron stores. Body stores are insufficient to meet the increased iron needs making it necessary for the baby to receive a dependable source of iron to prevent iron deficiency anemia. Iron deficiency anemia is associated with cognitive and psychomotor impairments that may be irreversible, along with decreased immune function, apathy, short attention span, and irritability. Feeding of low-iron infant formula can compromise a baby's iron stores and lead to iron deficiency anemia.

Feeding a baby cow's milk instead of breast milk or infant formula is considered to be NRF 411a. This is because:

- The protein level in cow's milk is too high and may stress the baby 's immature system;
- The type of protein and fat are more difficult for the baby to digest;
- It contains higher levels of sodium and other minerals than are recommended;
- It is a poor source of iron and vitamin C; and
- It may cause intestinal bleeding and contribute to the development of iron-deficiency anemia.

Homemade formulas prepared with canned evaporated milk do not contain optimal kinds and amounts of nutrients babies need. Goat's milk, sheep's milk, imitation milks, and substitute milks do not contain nutrients in amounts appropriate for babies.

NRF 411b (Low Risk): Routinely using nursing bottles or cups improperly

Defined as:

- Using a bottle to feed fruit juice.
- Feeding any sugar-containing fluids, such as soda/soft drinks, gelatin water, corn syrup solutions, and sweetened tea.
- Allowing the baby to fall asleep or be put to bed with a bottle at naps or bedtime.
- Allowing the baby to use the bottle without restrictions (e.g., walking around with a bottle) or as a pacifier.
- Propping the bottle when feeding.
- Allowing a baby to carry around and drink throughout the day from a covered or training cup.
- Adding any food (cereal or other solid foods) to the baby's bottle.

Inappropriate use of a bottle can damage a baby's or child's teeth. Caregivers sometimes don't understand that these practices are bad even if the baby does not have teeth yet. These practices set food habits that are very hard to break as the baby or child gets older. Putting a baby to bed with a bottle also increases the likelihood of ear infections.

Solid and sweet fluids in a bottle limit intake of breast milk or formula. Solids in a bottle can also result in choking especially if the hole in a nipple is made larger to accommodate flow of solid out of the bottle.

The AAP and the American Academy of Pedodontics (pediatric dentistry) recommend that juice should be offered to babies in a cup, not a bottle.

NRF 411c (Low Risk): Routinely offering complementary foods or other substances that are inappropriate in type or timing.

Examples are:

- Adding sweet agents such as sugar, honey or syrups to any beverage (including water) or prepared food, or used on a pacifier.
- Any food other than breast milk or iron-fortified infant formula before 4 months of age.
- Feeding solid foods too early (i.e. before 4-6 months of age) or adding diluted cereal or other solid foods to bottles deprives babies of the opportunity to learn to feed themselves. The major objection to the introduction of solids before age 4 months of age is based on the possibility that it may interfere with establishing sound eating habits and may contribute to overfeeding.

NRF: 411d (Low Risk): Routinely using feeding practices that disregard the developmental needs or stage of the infant.

Defined as:

- Inability to recognize, insensitivity to, or disregarding the baby's cues for hunger and satiety (e.g. forcing a baby to eat a certain type and/or amount of food or beverage or ignoring an baby's hunger cues).
- Feeding foods of inappropriate consistency, size, or shape that puts babies at risk of choking.
- Not supporting a baby's need for growing independence with self-feeding (e.g. solely spoon-feeding a baby who is able and ready to finger-feed and/or try self-feeding with appropriate utensils).
- Feeding a baby food with inappropriate textures based on his/her developmental stage (e.g. feeding primarily pureed or liquid foods when the baby is ready and capable of eating mashed, chopped or appropriate finger foods).

Babies s held to rigid feeding schedules are often underfed or overfed. Caregivers insensitive to signs of hunger and satiety, or who over manage feeding may inappropriately restrict or encourage excessive intake. Findings show that these practices may promote negative or unpleasant association with eating that may continue into later life, and may also contribute to obesity. Babies should be fed foods with a texture appropriate to their developmental level.

NRF 411e (Low Risk): Feeding foods to an infant that could be contaminated with harmful microorganisms or toxins.

Examples are:

- Unpasteurized fruit or vegetable juice
- Unpasteurized dairy products or soft cheeses such as Feta, Brie, Camembert, Blue-veined and Mexican-style cheese
- Honey (added to liquids or solid foods, used in cooking, as part of processed foods, on a pacifier, etc.)
- Raw or undercooked meat, fish, poultry or eggs
- Raw vegetable sprouts (alfalfa, clover, bean and radish)
- Deli meat, hot dogs and processed meats (avoid unless heated until steaming hot)

Only pasteurized juice, which is free of microorganisms, is safe for babies. Unpasteurized juice may contain pathogens, such as *Escherichia coli*, *Salmonella* and *Cryptosporidia* organisms. These organisms can cause serious disease, such as hemolyticuremic syndrome, and even death, and should never be fed to babies. Babies should not eat

Ways to reduce the risk of choking in infancy

The AAP recommends keeping these foods away from children under the age of four:

- Hot dogs
- Nuts and seeds
- Chunks of meat or cheese
- Whole grapes
- Hard, gooey or sticky candy
- Popcorn
- Chunks of peanut butter
- Raw vegetables
- Raisins
- Chewing gum

raw or unpasteurized milk or cheeses – unpasteurized dairy products could contain harmful bacteria, such as *Brucellae* species, that could cause babies to contract a dangerous food borne illness. The AAP also recommends that young children should not eat soft cheeses such as Feta, Brie, Camembert, Blue-veined and Mexican-style cheese – these foods could contain *Listeria* bacteria (hard cheeses, processed cheeses, cream cheese, cottage cheese and yogurt do not need to be avoided).

Honey has been implicated as the primary food source of *Clostridium botulinum* during infancy. These spores are extremely resistant to heat, including pasteurization, and are not destroyed by present methods of processing honey. Botulism in infancy is caused by ingestion of the spores, which germinate into the toxin in the lumen of the bowel.

Babies should not eat raw or undercooked meat or poultry, raw fish or shellfish, including oysters, clams, mussels, and scallops – these foods may contain harmful bacteria or parasites that could cause children to contract dangerous food borne illnesses.

Background information regarding foods that could be contaminated with harmful microorganisms is also included below:

- Raw vegetable sprouts (alfalfa, clover, bean and radish). Sprouts can cause potentially dangerous *Salmonella* and *E-coli* 0157 infection. Sprouts grown under clean conditions in the home also present a risk because bacteria may be present in seed. Cook sprouts to significantly reduce the risk of illness.
- Deli meats, hot dogs and processed meats (avoid unless heated until steaming hot) – These foods have been found to be contaminated with *Listeria monocytogenes*; if adequately cooked, this bacteria is destroyed. *Listeria* bacteria live at cold temperatures as well and thus proper refrigeration does not prevent infection of this type of bacteria.

NRF 411f (Low Risk): Routinely feeding inappropriately diluted formula.

Defined as:

- Failure to follow manufacturer's dilution instruction (to include stretching formula for household economic reasons).
- Failure to follow specific instruction accompanying a prescription.

Over dilution can result in water intoxication resulting in hyponatremia; irritability; coma; inadequate nutrient intake; failure to thrive; poor growth. Under dilution of formula increases calories, protein and solutes presented to the kidney for excretion and can result in hypernatremia, tetany and obesity. Dehydration and metabolic acidosis can occur.

Powdered formulas vary in density so manufacturer's scoops are formula-specific to assure correct dilution. One clue for staff to identify incorrect formula preparation is to determine if the caregiver is using the correct manufacture's scoop to prepare the formula.

NRF 411g (Low Risk): Routinely limiting the frequency of nursing of the exclusively breastfed infant when human milk is the sole source of nutrients.

Examples are:

- Scheduled feedings instead of demand feedings
- Less than 8 feedings in 24 hours if less than 2 months of age
- Less than 6 feeding in 24 hours if between 2 and 6 months of age

Exclusive breastfeeding provides ideal nutrition to a baby and is sufficient to support optimal growth and development in the first 6 months of life. Frequent breastfeeding is critical to the establishment and maintenance of an adequate milk supply for the baby. Inadequate frequency of breastfeeding may lead to lactation failure in the mother and dehydration, poor weight gain, diarrhea, vomiting, illness, and malnourishment in the baby.

NRF 411h (Low Risk): Routinely feeding a diet very low in calories and/or essential nutrients.

Examples are:

- Vegan diet
- Macrobiotic diet
- Other diets very low in calories and/or essential nutrients

Highly restrictive diets prevent adequate intake of nutrients, interfere with growth and development, and may lead to other adverse physiological effects.

NRF 411i (Low Risk): Routinely using inappropriate sanitation in preparation, handling, and storage of expressed human milk or formula.

Examples are:

- Limited or no access to a:
 - Safe water supply (documented by appropriate officials)
 - Heat source for sterilization
 - Refrigerator or freezer for storage
- Failure to properly wash, prepare, handle and store bottles, storage containers or breast pumps; examples include:

Infant formula must be properly prepared in a sanitary manner in order to be safe for consumption. Further, expressed breast milk and prepared infant formula are perishable foods, which must be handled and stored properly in order to be safe for consumption.

The following breast milk feeding, handling, and storage practices are considered inappropriate and unsafe:

- Thawing in a microwave
- Refreezing

- Adding freshly expressed unrefrigerated human milk to frozen human milk
- Adding refrigerated human milk to frozen human milk in an amount that is greater than the amount of frozen human milk
- Feeding thawed human milk more than 24 hours after it was thawed
- Saving human milk from a used bottle for another feeding
- Failure to clean breast pump per manufacturer's instructions

Published guidelines on the handling and storage of infant formula indicate that it is unsafe to feed a baby prepared formula which, for example:

- Has been held at room temperature longer than 1 hour or longer than recommended by manufacturer
- Held in refrigerator longer than 48 hours (concentrated or ready-to feed) or 24 hours (prepared from powdered)
- Remains in a bottle one hour after the start of feeding
- Remains in a bottle from an earlier feeding
- Storing at room temperature for more than 1 hour
- Failure to store prepared formula per manufacturer's instructions.
- Using formula in a bottle one hour after the start of a feeding
- Saving formula from a used bottle for another feeding
- Failure to clean bottle properly

Good sanitation is critical for the health of a baby. Gastrointestinal diseases caused by bacteria and viruses are a major cause of illness and death in young babies. Babies do not have a fully functioning immune system to protect them from many diseases. Babies who are fed infant formulas are especially susceptible because formula lacks the immunological factors found in breast milk that are important in helping to prevent gastrointestinal infections.

Note: NRF 411b and NRF 411i may at times identify the same condition. For example, a baby who is kept in the crib all night with a bottle of breast milk or formula would qualify for NRF 411b because the bottle is being used as a pacifier and NRF 411i because the bottle is at room temperature for more than 2 hours.

Examples to help identify NRF 411i:

If water used to mix formula and to clean bottles is not coming from a municipal water supply or well that has been tested for contaminants.

If the caregiver says they have no stove in their home.

If bottles/nipples are not washed between feedings.

If bottles are not protected from contamination after washing (e.g., they are used as toys, pets have access to them).

NRF 411j (Low Risk): Feeding dietary supplements with potentially harmful consequences.

Examples of dietary supplements, which when fed in excess of recommended dosage, may be toxic or have harmful consequences:

- Single or multi-vitamins
- Mineral supplements
- Herbal or botanical supplements/remedies/teas

A baby consuming inappropriate or excessive amounts of single or multivitamins, minerals or herbal remedies not prescribed by a health care provider is at risk for a variety of adverse effects including harmful nutrient interactions, toxicity and teratogenicity (ability to cause birth defects).

NRF 411k (Low Risk): Routinely not providing dietary supplements recognized as essential by national public health policy when an infant's diet alone cannot meet nutrient requirements.

- Babies who are 6 months of age or older who are ingesting less than 0.25 mg of fluoride daily when the water supply contains less than 0.3 ppm fluoride.
- Babies who are exclusively breastfed, or who are ingesting less than one liter (or one quart) per day of vitamin D-fortified formula, and are not taking a supplement of 400 IU of vitamin D.

Depending on a baby's specific needs and environmental circumstances, certain dietary supplements may be recommended by the baby's health care provider to ensure health. For example, fluoride supplements may be of benefit in reducing dental decay for children living in fluoride-deficient areas. Vitamin D helps in the prevention of rickets, a bone disorder, for babies. It is important to refer babies to their health care provider to determine if a supplement is needed.

NRF #428 (Low Risk): Dietary Risk Associated with Complementary Feeding Practices (ONLY for 4-12 month old infants after a complete nutrition assessment has been performed and no other risks are identified)

A baby 4-12 months of age who has begun to or is expected to begin to:

- Consume complementary foods and beverages
- Eat independently
- Be weaned from breast milk or infant formula, or
- Transition from a diet based on baby/toddler foods to one based on the *Dietary Guidelines for Americans*.

Note: A complete nutrition assessment, including for risk #411, Inappropriate Nutrition Practices for Infants must be completed prior to assigning this risk.

Inappropriate complementary feeding practices are common and well documented in the literature. Caregivers often do not recognize signs of developmental readiness and, therefore, offer foods and beverages that may be inappropriate in type, amount, consistency and texture.

Responding to feeding and diet-related risk factors

Once a caregiver indicates they are feeding their baby in a way that puts their baby at nutrition or health risk, staff must first ask questions to gather more information. For example, staff will want to determine why the caregiver is practicing a certain feeding behavior.

"I see that you haven't begun feeding Johnny solids yet. Would you tell me more about why you are choosing to wait?"

"You mentioned that you put cereal in Johnny's bottle. What have you heard about offering cereal in the bottle?"

Staff can ask questions to find out what the caregiver is planning for the baby's successive months of feeding.

"I see that you are feeding Tanisha all types of baby foods now. What are you thinking of doing next to progress her eating skills?"

Staff may also need to inquire about the eating environment and feeding relationship.

"I see that you are propping the bottle for your baby. How do you typically feed him?"

This way, if the caregiver states they usually hold the baby, you can praise them for what they are doing right and then provide education on the reasons why propping the bottle is not a good practice.

Staff should provide information about the specific risks for each practice. WIC staff are in a unique role to be able to provide anticipatory guidance (or telling caregivers what to expect next) on feeding and developmental stages. Staff can provide guidance and information on topics such as the caregiver's role in feeding, introducing new foods, nutrient adequacy, how to prepare formula properly and so on. Educate the caregiver on appropriate feeding practices incorporating best practices discussed in this module. Listen to the caregiver to learn what they would like to work on. Negotiate a plan that works toward healthier feeding habits. Find out what might or might not be helpful with carrying out the plan. Work together with the caregiver to find a solution. Once the plan has been developed to a comfort level for the caregiver, confirm the caregiver understands and agrees with the plan. Offer the caregiver a related pamphlet to help reinforce the message.

SELF-CHECK: PRACTICE YOUR KNOWLEDGE

Match the risks with the correlating reason to identify why it is a risk in infancy.

- | | |
|--|---|
| 1. ____feeding cow's milk | a. may lead to lactation failure and result in dehydration, poor weight gain, illness and malnutrition. |
| 2. ____feeding solids from a bottle | |
| 3. ____strict limits on number of breastfeeding sessions | b. can lead to overfeeding and delay baby's ability to feed self |
| 4. ____propping the bottle in the baby's mouth | c. can stress baby's kidneys because of high levels of protein and minerals |
| 5. ____feeding a vegan diet | d. baby may not receive adequate nutrients for growth and development. |
| | e. limits the ability for an baby to show his fullness and can cause choking |

ANSWERS

1. c
2. b or e
3. a
4. e or b
5. d

Growth-Related Nutrition Risk Factors

Introduction

In addition to feeding and diet-related risk factors, there are growth-related factors that may be affected by nutrition and therefore also will qualify a baby for the WIC Program. A baby's birth weight, length, gestational age at birth, as well as the baby's weight gain during the first year of life are indicators of how a baby will likely grow or is growing. The quality and quantity of the baby's diet will further influence the baby's growth and development.

It is important to recognize that identifying WIC babies as having growth-related risk factors provides staff with a baseline for providing education. It does not necessarily mean that aggressive nutrition intervention is needed.

For example, a baby born with a low birth weight will need to receive optimum nutrition in order to grow to his/her potential. WIC staff have an opportunity to greatly improve the outcome of a baby with growth challenges by providing nutrition education and, when necessary, making referrals to the WIC High Risk Counselor, health care providers, and other programs to help families with children who have special needs.

If WIC staff identify a baby with a rapid increase in weight, (jumping channels on the growth grid) staff should gather information on feeding and eating skills and the family environment to assess whether the family may benefit from baby feeding guideline review or other nutrition information and education and counseling.

In all situations, an important role of the WIC staff is to collect information to best understand what the caregiver's concerns are about the baby. In WIC, staff become skilled at finding out about the baby's feeding environment (when and where the baby is fed, who feeds the baby, does the baby feed himself, etc.). Staff must assess the caregiver's level of concern about feeding-related issues and learn how they are responding to them.

For example, a mother is concerned that her baby is small and is not drinking enough formula, so she has been trying to make the baby finish all bottles. The mother may not realize that her

Growth and Development in Infants

Growth is an increase in the physical size of the body whereas development is the process of maturing. Several factors affect these milestones of infancy.

1. Genetics - Inherited family characteristics that influence body build and height as well as inherited hormonal deficiencies such as, hypothyroidism, can affect normal growth and development.

2. Environment - Social and economic variables (such as, caregiver's ability to show affection, living in poverty, parents' educational level) that influence a person's ability to grow and develop.

3. Behaviors - Mother's behaviors can affect an infant's biological abilities for growth. For example, habits such as smoking or drug use during pregnancy can reduce birth weight and affect growth. Caregiver's food selection and feeding behaviors can affect growth and development.

feeding reaction could make the situation worse. In WIC we want to emphasize healthy feeding relationships rather than focus only on weight.

In this situation, WIC staff could acknowledge the mother's concern about the baby's size and then go on to collect information about the feeding environment to determine what to discuss.

In WIC we want to emphasize a healthy feeding relationship rather than to focus only on weight.

WIC staff are a great source of nutrition and developmental information. By providing anticipatory guidance on the next developmental milestone or expectation with feeding, you can prevent inappropriate feeding behaviors from ever occurring. At every visit, praise caregivers for what they are doing correctly. Help caregivers increase their confidence in care giving and, maybe, they'll be more open to other suggestions.

Another important role of WIC staff is referring participants to their health care providers and other appropriate community resources.

Monitoring Growth

WIC uses the 2006 World Health Organization (WHO) growth charts as a standard to evaluate growth of all babies and children up to 2 years of age. The WHO growth charts are based on a large international sample of predominately breastfed babies and children who received optimal nutrition and care. All babies included in the study were predominately (i.e., exclusively or nearly exclusively) breastfed for at least 4 months and were still breastfeeding at 12 months. Thus the growth charts are considered the standard; they identify how children *should* grow when provided with optimal conditions.

The WHO growth standards use values of 2 standard deviations away from the median to identify children whose growth might indicate adverse health conditions. Two standard deviations above the median is the 97.7th percentile; two standard deviations below the median is the 2.3rd percentile. For ease of use, charts are labeled as the 98th percentile and 2nd percentile. Babies at or above the 98th percentile weight for length are defined as "high weight for length." Babies at or below the 2nd percentile weight for length are defined as "underweight." Babies between the 2nd and 5th percentiles are defined as "at risk for underweight."

Percentiles also serve as a reference for comparison. For example, a 6 month old male who is at the 25th percentile length for age is taller than 25% of the boys his age and shorter than 75% of the boys his age. Don't get caught up in treating growth curves like grades in school. A baby growing at the 95th percentile isn't doing any better than the one growing at the 5th percentile. The most important aspect of the growth curve is to be able to compare each individual baby to himself--to evaluate his growth as it progresses from one month to the next.

Weighing and measuring babies and recording measurements from two or more visits allow staff to assess a baby's growth pattern over time. In theory a baby whose length is at the 25th percentile should continue to grow so that her length stays at the 25th percentile over time. This is not always true. However, the greater the difference from a percentile line the more concern there is that something unusual is going on with the baby's growth. Growth that varies greatly from a normal growth channel needs to be referred to the WIC High Risk Counselor for evaluation. Poor growth can indicate poor nutrition (though poor growth can also result from other factors such as illness).

You will want to assess whether an odd result is an inaccurate measurement or a potential health problem. Refer to the Level 1: Screening Module for more information on growth and measurement.

Let's now review the risk factors related to growth.

The Underweight Infant

Underweight reflects the body's thinness. It doesn't tell us the cause or nature of underweight. Poverty, infectious disease, and inadequate energy intake are some factors that can lead to underweight. The baby who weighs less than other babies of the same length and age may be an indication of a medical problem, a feeding problem, or perhaps it may be a normal weight for the baby.

There are many reasons why a baby may have difficulty with gaining weight. Some of these include:

- Inadequate intake of food being offered (such as with a family in poverty, a depressed caregiver, quiet baby who doesn't let his needs be known, or caregiver who lacks knowledge and information on the needs of an baby); or
- Inadequate retention of food, such as is common with vomiting, reflux, and diarrhea; or
- Inadequate absorption of food as noted with cystic fibrosis; or
- Increased calorie needs; or
- Decreased growth efficiency with certain diseases or illnesses (such as with the human immunodeficiency virus).

NRF 103a: At Risk of Underweight

Defined as >2nd percentile and < 5th percentile weight-for-length.

Low risk

NRF: 103b Underweight

Defined as ≤2nd percentile weight-for-length.

High Risk

Education Tips and Follow Up:

- Establish a rapport with the caregiver to determine possible factors for the baby's low weight. Complete the Nutrition Interview and ask questions to determine appropriate frequency of feeds and length of feeds.
- If formula feeding, ask how formula is being prepared.

- Find out about the eating environment.
- Find out how the caregiver feels about the baby's weight.
- Ask what the health care provider has said.
- Discuss the general eating behaviors/problems that can lead to inadequate calorie intake.
- Babies with a weight-for-length less than or equal to the 2nd percentile are high risk, so refer the baby to the WIC High Risk Counselor for high-risk counseling within 30 days.
- For babies with a weight-for-length greater than the 5th percentile to less than or equal to the 10th percentile, the growth is probably fine, but growth should be watched and further assessment into feeding practices should occur.

The Infant with Short Stature

Short stature is defined by two risk factors (see side bar). Stature is the amount of linear growth that has been achieved. Short length may be an indication of some form of chronic under nutrition due to a disease process or inadequate intake of nutrients. Over a long period of time an illness or nutritional deficiency may contribute to linear growth retardation or cessation. Stunted babies are likely to become stunted children, and stunted children are likely to become stunted adolescents, and so on.

It may also be perfectly normal for a baby to be small. Some children have a family history of short stature and grow at a normal rate; however, short parental stature shouldn't be used as an explanation for a child's poor growth. WIC staff must assess normal, healthy feeding and eating to ensure nutrition is not affecting the baby's growth.

Education Tips and Follow Up:

- Establish a rapport with the caregiver to find out how they feel about the baby's stature and what the health care provider has mentioned. Complete the Nutrition Interview and ask questions to determine appropriate frequency of feeds and length of feeds.
- Find out about the eating environment. Talk about general eating behaviors/problems that can lead to inadequate intake.
- Review appropriate eating behaviors and offer information on the progression of solids and feeding abilities to expect in the coming months.

NRF 121a: At Risk for Short Stature

Defined as $>2^{\text{nd}}$ percentile and $<5^{\text{th}}$ percentile length-for-age.

Low risk

Note: Assignment for premature infants is based on adjusted gestational age.

NRF 121b: Short Stature

Defined as $<2^{\text{nd}}$ percentile length-for-age.

Low risk

Note: Assignment for premature infants is based on adjusted gestational age.

- Short stature is a low risk factor and therefore follow up is provided by the educator.

The Failure to Thrive Baby

Failure to thrive (FTT) is a serious growth problem with an often complex etiology (cause). Some of the indicators that a health care provider might use to diagnose FTT include:

- Weight consistently below the 3rd percentile for age;
- Weight less than 80% of ideal weight for height/age;
- Progressive fall-off in weight to below the 3rd percentile;
- A decrease in expected rate of growth along the child's previously defined growth curve irrespective of its relationship to the 3rd percentile.

There are many causes of failure to thrive. Among the ways to categorize the different conditions that cause failure to thrive and poor weight gain is to group them into conditions that cause a **decreased intake** of calories or an **increased loss** of calories.

Children may also have failure to thrive from having an **increased requirement** for calories, such as from having a chronic infection, hyperthyroidism, congenital heart disease or chronic lung problems.

NRF 134: Failure to Thrive

Defined as presence of failure to thrive (FTT) diagnosed, documented or reported by a health care provider or someone working under a health care provider's orders, or as self-reported by endorser/caregiver.

High risk

Education Tips and Follow Up:

- Establish a rapport with the caregiver to find out how they feel about the baby's growth and what the health care provider has mentioned.
- Complete the Nutrition Interview and ask questions to determine appropriate frequency of feeds and length of feeds. If formula-fed, question how the formula is mixed. If breastfeeding, assess for restricted feedings.
- Ask questions to determine if there are medical reasons for why the baby is failure to thrive.
- Ask how the caregiver knows when her baby is hungry and full. Ask about the types of solids being offered.
- Inquire about the eating environment.
- Discuss age appropriate foods and the general eating behaviors/problems which can lead to inadequate calorie intake.
- Make referrals to community resources as needed.
- Refer to the WIC High Risk Counselor for high-risk counseling within 30 days.

The Infant with Inadequate or Potentially Inadequate Growth

Inadequate growth is assessed by measuring the differences of weights and lengths between two points in time. Those measurements are plotted on charts to determine the rate of growth. In most cases, once a baby is established in a percentile rating of growth, she will remain in that percentile track. When a baby does not grow at her/his expected rate, we become

concerned that either s/he is not receiving adequate nutrition, or that s/he may have a medical problem. See side bar for the risk factor that defines inadequate growth.

Possible factors associated with not adequately nourishing a baby include:

- A lack of social support for the caregiver;
- A disorganized family;
- A depressed caregiver;
- A caregiver's lack of education, health, and nutrition knowledge.

NRF 135: Inadequate Growth

Defined as:

Infants from birth to 1 month of age

Current weight:

- Excessive weight loss after birth (Current weight is $\leq 92\%$ of birth weight); or
- Not back to birth weight by 2 weeks of age

Both above criteria require further assessment and counseling by the WIC High Risk Counselor within 24 hours of risk identification.

Infants from 1 month up to 12 months of age:

Any weight gain that is less than the expected weight gain as calculated from the *Minimum Expected Weight Gain Tables* using current weight and the most recent previous weight.

Further assessment and counseling by the WIC High Risk Counselor is required within 30 days of risk identification.

Education Tips and Follow Up:

- Establish a rapport with the caregiver to find out how they feel about their baby's growth and what their health care provider has mentioned. Complete the Nutrition Interview and ask questions to determine appropriate frequency of feeds and length of feeds. If formula-fed, question how the formula is mixed.
- Ask how the caregiver knows when her baby is hungry and full. Ask about the types of solids being offered.
- Inquire about the eating environment.
- Discuss age appropriate foods and the general eating behaviors/problems which can lead to inadequate calorie intake.
- Refer to the WIC High Risk Counselor for high-risk counseling:
 - Within 24 hours for high risk babies birth to 1 month of age.
 - Within 30 days for older babies.

Under some conditions, the educators may also choose to have the WIC High Risk Counselor follow up with a baby who is not high risk but has a growth concern.

The Low Birth Weight and Small for Gestational Age Infant

Babies born with a low or very low birth weight have more health challenges than babies born with normal birth weights. Low birth weight babies are either born small for their gestational age (SGA) or born prematurely (see next risk factor, NRF #142).

SGA babies weigh less and may be shorter than expected for their birth date. This low birth weight may be the result of intrauterine under nutrition. Inadequate nutrition to the uterus can be caused by any condition that interferes with the transfer of nutrients and oxygen from the mother to the baby before birth. This can happen if during pregnancy the mother smoked, had a poor diet, or if the baby had certain medical problems. Appropriate nutrition is necessary for these babies to grow and develop. Some low birth weight babies may not get enough attention from their caregivers if they are too weak to cry loudly or cannot move about normally. Other babies may not get enough to eat if they are too weak to suck.

Education Tips and Follow Up:

- Encourage caregivers to follow their health care provider's advice on breast and formula feeding and vitamin and mineral supplements. Support caregiver's plans to breast or formula feed.
- Caregivers of young babies are probably receiving more advice than most other caregivers; be sensitive to the fact that they may be overwhelmed by too much "good advice."
- Find out how the caregiver can tell when the baby is hungry and full.
- When the caregiver is getting ready to progress their baby to solids, review the signs of the baby's development readiness.
- Make referrals to community resources as needed.
- Refer to the WIC High Risk Counselor for high risk counseling within 30 days.

NRF 141a: Low Birth Weight

Defined as birth weight < 5 pounds 8 ounces (<2500 grams).

High Risk

NRF 141b: Very Low Birth Weight

Defined as birth weight < 3 pounds 5 ounces (< 1500 grams)

High Risk

NRF 151: Small for Gestational Age

Defined as infants and children less than 24 months of age diagnosed as small for gestational age

High risk

The Infant Born Prematurely

A baby born three or more weeks before the due date (at or before 37 weeks gestation) is described as being premature. It is difficult for the premature baby, who comes into the world early, to get enough nutrition to complete the rapid growth and development that

would normally occur in the last weeks before birth. The premature baby's weight at birth may be appropriate for his gestational age. His/her nutritional needs are greater than mature term babies because he/she is continuing to "catch up" in growth and development and to lay down nutrient and energy stores that are normally complete by full term birth. His/her immature feeding skills, such as sucking and swallowing, and immature digestive system, interfere with meeting these nutritional needs.

NRF 142: Prematurity

Defined as infant born ≤ 37 weeks/0 days gestation

Low risk

Education Tips and Follow Up:

- Encourage caregivers to receive and follow their health care provider's advice on breast and formula feeding, and vitamin and mineral supplements. Support caregiver's plans for breast or formula feeding.
- Caregivers of young babies are probably receiving more advice than most other caregivers; be sensitive to the fact that they may be overwhelmed with too much "good advice."
- Find out how the caregiver can tell when the baby is hungry and full.
- When the caregiver is getting ready to progress their baby to solids, the child's health care provider should review the signs of the baby's developmental readiness.
- Preterm babies are considered to be at low risk. Note that a baby who is both premature and low birth weight is high risk due to their low birth weight risk, and thus must be referred to the WIC High Risk Counselor for high risk counseling within 30 days.

NRF 153: Large for Gestational Age

Defined as birth weight ≥ 9 pounds (≥ 4000 gm) or presence of large for gestational age.

Low Risk

The Large for Gestational Age Infant

Babies born with a birth weight of 9 pounds or more (4000 grams or more) are considered large for gestational age (LGA). LGA babies are most often born to mothers who are obese, who gain excessive weight during pregnancy, or who have diabetes. A mother's size and family genetics are also major factors. A woman who herself was over 8 pounds at birth is twice as likely to have a large baby. Native American, Latino and Caucasian women tend to have larger babies than women in other ethnic groups. Because of the baby's large size, vaginal delivery may be difficult, take longer, and occasionally results in birth injury, bruising or breathing problems. LGA babies are often listless, limp and feed poorly. Babies born to mothers who have diabetes are very likely to become hypoglycemic in the first one to two

hours after delivery. Skin-to-skin contact immediately after birth and breastfeeding in the delivery room is highly recommended to keep the baby's blood sugar from dropping.

The presence of LGA must be diagnosed, documented, or reported by a health care provider or someone working under a health care provider's orders, or as self reported by applicant/participant/caregiver.

Education Tips and Follow Up:

- Complete a thorough nutrition assessment as outlined in the infant normal protocols.
- Find out how the caregiver can tell when the baby is hungry and full.
- Encourage caregivers to feed the baby on demand.
- When the caregiver is getting ready to progress the baby to solids, review the signs of the baby's developmental readiness.

NRF 114: At Risk of Overweight

Defined as biological mother with a BMI ≥ 30 at the time of conception or at any point in the first trimester of pregnancy. Biological father with a BMI ≥ 30 at the time of certification.

Low Risk

The "Overweight" Infant

The rise in the prevalence of overweight and obesity in children adolescents is one of the most important public health issues in the United States today. The risk of a baby growing up to become an overweight adult is related to the size of his/her parents. That is, if one or both of the baby's parents are overweight, the likelihood the baby will grow up to be an overweight adult increases.

NRF 115: High Weight-for-Length

Defined as weight-for-length $\geq 98^{\text{th}}$ percentile
Low Risk

Note that Compass will assign NRF 114 using the biological mother's most recent pregnancy record. To risk based on biological father's BMI, the BMI must be based on self-reported weight and height by the parent in attendance (i.e., one parent may not "self-report" for the other parent) or weight and height measurements taken by staff at the time of certification.

High weight-for-length, NRF 115 is based on the baby's weight. Babies who become overweight should never be put on a diet to lose weight. Weight loss during infancy would deprive the baby of nutrients needed for growth and development. *These babies should be given time to "grow into" their weight.*

Education Tips and Follow Up:

- Complete a thorough nutrition assessment as outlined in normal baby protocols.
- Complete the Nutrition Interview to obtain clues on how the baby is being fed. The overweight baby's diet should be assessed to determine whether it is developmentally appropriate for the baby, whether correct formula dilutions are being made, and if any inappropriate foods are being fed.

- Find out how the caregiver knows when her baby is hungry and full.
- Discuss the baby's behaviors and patterns of eating. Determine if the feeding relationship could be improved.
- Find out how the baby is treated when he cries.
- Discuss with the caregiver the child's behavior and patterns of eating which may identify potential feeding issues and make suggestions. Some suggestions for caregivers include:
 - If feeding solids in the bottle, recommend only feeding solids from a spoon when developmentally ready. If not ready, stop the feeding of solids entirely.
 - If finger foods include cookies and other high fat treats, suggest nutritious finger foods such as soft fruit and cooked vegetables.
 - If giving sweetened water or soft drinks, advise that breast milk or formula is the best choice for thirst. Limit juice or, better yet, eliminate entirely.
 - Discourage forcing the baby to finish a bottle or food. Discuss how to watch for the baby's signs of fullness and respect them.
 - If food is used to quiet the baby every time he cries, encourage the caregiver to distinguish between cries of hunger and those of discomfort. Offer food only when the baby is hungry.
 - If the baby is kept mostly in an infant carrier, encourage the caregiver to allow the baby to be active by playing with him; let him move unrestricted.
 - If the baby is forced to eat everything that is offered, recommend that caregivers respect the baby's food likes, dislikes, and needs. Most babies like plain food. Butter and sugar may make the flavor palatable to caregivers, but adds unnecessary, low nutrient dense calories for baby. Caregivers can learn to read labels on baby food jars and avoid the extra calories provided by sugar. Suggest caregivers be in charge and take responsibility for the child's health. Older children, grandparents, and babysitters often feed the baby and may not be as particular as the caregiver about what the baby is being fed.

SELF-CHECK: PRACTICE YOUR KNOWLEDGE

1. True (T) or False (F)?
 - __a. "Overweight" babies are generally put on a weight-loss diet to avoid obesity in later life.
 - __b. Overfeeding of formula or solids for an extended period of time can cause babies to become overweight.
 - __c. A caregiver of an overweight baby should not use food to quiet the baby every time the baby cries.
 - __d. The baby who weighs less than other babies of the same length and age may be of normal weight for that baby.
 - __e. Nutritional deficiencies over a long period of time may lead to growth retardation.
 - __f. Short stature is not a concern if both parents are short.
2. Besides the information collected on the Nutrition Interview and infant growth charts, what is a question to ask the caregiver to collect information of the feeding relationship?
3. A baby is defined as having a low birth weight if (s)he weighs _____ at birth.
4. Any baby is described as being premature if (s)he is born at or before _____ weeks gestation.

ANSWERS

1.

a. F	d. T
b. T	e. T
c. T	f. F, Short stature in parents shouldn't be used to explain poor growth. WIC staff must assess feeding and eating to ensure adequate nutrition.
2. Any one of the following:
 - a. How can you tell when your baby is hungry?
 - b. How can you tell when your baby is full?
 - c. Who feeds the baby?
3. ≤ 5 pounds 8 ounces
4. 37

Biochemical and Other Medical Indicators of Nutrition Risk

In addition to diet and growth-related risk factors, there are several biochemical and medical indicators that define nutritional risk.

These include low hemoglobin or hematocrit, elevated blood lead levels, breastfeeding complications, and specific medical conditions.

The Baby with Low Hemoglobin or Low Hematocrit

Hemoglobin and hematocrit are the most commonly used tests to screen for iron deficiency anemia. Measurements of hemoglobin and hematocrit reflect the amount of functional iron in the body. Changes in the hemoglobin concentration and hematocrit occur at the late stages of iron deficiency. While neither a hemoglobin or hematocrit test is a direct measure of iron status and do not distinguish among different types of anemia, these tests are useful indicators of iron deficiency anemia.

The most common form of nutrition-related anemia is iron-deficiency, which can be caused by a diet inadequate in iron. Inadequate intake of iron in infancy has been found to be related to poverty, inadequate dietary intake, and malnutrition. Babies who do not receive an appropriate iron source after six months of age are at risk for developing anemia. Iron deficiency can result in poor growth, decreased resistance to infection, fatigue, irritability, behavioral problems, and deficits in cognitive ability. Appropriate iron sources include iron fortified formula, iron-fortified infant cereals, meats, or oral iron supplements. Breastfed babies who are not receiving iron rich solids after six months of age are at risk for anemia. Low birth weight babies are also at increased risk of developing anemia because of low neonatal iron stores. Babies on low-iron formulas are also at risk for anemia. The Colorado WIC Program does not permit the issuance of low-iron formulas.

Education Tips and Follow Up:

- Encourage caregivers to receive and follow their health care provider’s advice on breast and formula feeding, and vitamin and mineral supplements. Support caregiver’s plans for breast or formula feeding.

NRF 201: Low Hemoglobin / Low Hematocrit

Low Risk

Defined as hemoglobin levels below the following standards:

Elevation (feet)	Low risk
<11.2%	
4000-4999	<11.3%
5000-5999	<11.5%
6000-6999	<11.7%
7000-7999	<12.0%
8000-8999	<12.3%
9000-9999	<12.6%
>10,000	<13.0

NRF 201B: Severely Low Hemoglobin / Hematocrit

High Risk

Defined as hemoglobin levels low enough to necessitate a medical referral:

Elevation (feet)	High risk
3000-4999	< 9.5
5000-6999	< 9.8
7000-7999	<10.3
8000-8999	<10.6
9000-9999	<11.0
>10,000	<11.3

- Recommend iron fortified formula to all caregivers who choose to offer formula to their babies.
- Educate caregivers on the importance of offering iron-rich foods to a baby over 6 months of age. If the caregiver has not begun these foods, probe to understand her reasons.
- Educate caregivers on sources of iron-rich foods (such as iron-fortified infant cereals, mashed, cooked dry beans, and pureed/minced meats) for babies.
- Refer babies identified as high risk to the WIC High Risk Counselor for follow up.

The Infant with an Elevated Blood Lead Level

Occasionally a baby will be tested for a blood lead level. This information can be obtained from completing a thorough nutrition assessment. Lead poisoning can cause brain damage, mental retardation, and convulsions. Therefore it is very important to protect babies from sources of lead. Lead is a metal found in old paint, dust, soil, and sometimes, water. Babies can be exposed to lead by

putting objects containing lead (such as paint chips) or contaminated with lead (such as dust that clings to toys or other objects) in their mouths. Encourage caregivers to wash baby's hands before they eat. Additionally, some folk remedies containing lead should be avoided, for example, Hispanic families may use Azarcon and Greta, for colic. Lead poisoning in babies is a preventable disease. Furthermore, an adequate intake of iron, zinc, calcium, and calories is known to decrease a child's susceptibility to the toxic effects of lead.

NRF 211: Elevated Blood Lead Levels

Defined as blood lead level of > 10 micrograms/deciliter within the past 12 months.

High Risk

Education Tips and Follow Up:

- Encourage caregivers to receive and follow their health care provider's advice on vitamin and mineral supplements.
- Find out what the baby's health care provider says regarding the elevated blood lead level.
- Educate caregivers on the importance of offering an iron- and calcium-rich and balanced diet to their baby.
- Discuss ways to protect the baby from household sources of lead.
- Schedule the baby to see the WIC High Risk Counselor within 30 days of learning about the high blood lead value.

The Infant with Breastfeeding Complications

Breastfeeding babies identified with breastfeeding complications or a potential complication are considered high risk and must be referred to the WIC High Risk Counselor or a lactation management specialist (LMS) that day. The High Risk Counselor or LMS is responsible for conducting a full evaluation of the situation, determining the intervention and need for additional referral and follow-up. If the High Risk Counselor or lactation management specialist is not available, a referral must be made to the participant's health care provider.

Education Tips and Follow Up

A detailed description of staff's role in handling the participant with this risk factor is found in the *Breastfeeding Module and Resource Manual* and in the *Colorado WIC Program Nutrition Risk Manual*.

NRF 603: Breastfeeding Complications or Potential Complications

Defined as a breastfed infant with any of the following complications or potential complications for breastfeeding:

- Jaundice (603A)
- Weak or ineffective suck (603B)
- Difficulty latching onto mother's breast (603C)
- Inadequate stooling (for age, as determined by a health care provider or other health care professional), and/or less than 6 wet diapers per day. (603D)

High Risk

The Infant with Specific Medical Conditions

There are only certain medical conditions that can be used as nutrition risk factors. A medical problem is a nutrition risk factor if it causes, contributes to, or results from an inability to obtain adequate nutrition for growth and development of the baby or the maintenance of health. To be used, the condition must have been diagnosed by a health care provider (as self-reported by the caregiver); or be reported or documented by a health care provider, or someone working under health care provider's orders.

Some of these conditions interfere with eating a large variety of foods such as a wheat allergy (which may prevent eating not only many foods from the grain group, but many other foods containing wheat). Other conditions change the need for nutrients or energy so that they are significantly above or below the normal requirement for the participant's age. Examples of these conditions include severe burns, cancer, heart disease, and some kinds of cerebral palsy.

Some medical conditions require special diets, varied timing for when to start solids, nutrition supplements, eating equipment, or medications. For example, special diets are usually prescribed for babies with diabetes and certain metabolic disorders. Participants with cystic fibrosis and heart disease often use nutrition supplements and medications. Participants with severe cerebral palsy or cleft palate may use specially adapted eating utensils.

Risk Assessment: All medical conditions are high risk unless noted as low risk. Conditions noted with an asterisk (*) can be identified by the WIC staff.

Education Tips and Follow Up:

- Establish a rapport with the caregiver to develop trust.
- Determine if the baby’s health care provider requires a special diet for the baby and how you can support the diet if applicable.
- Offer information on the progression of the diet in infancy and educate on general feeding relationship behaviors if appropriate.
- Refer to the WIC High Risk Counselor for high risk counseling within 30 days.

Predisposing Nutrition Risk Factors

Lastly, there are conditions that predispose babies to inadequate nutrition patterns by virtue of caregiver’s limited ability to make feeding decisions and/or prepare food, residing in foster care, having a mother on WIC, or a mother who wasn’t on WIC but would have qualified, or being the baby of a priority I breastfeeding mother.

Environmental Tobacco Smoke Exposure

Secondhand smoke contains more than 4,000 chemicals, including 50 cancer-causing poisons. Breathing secondhand smoke is harmful to a baby’s health. Babies who breathe the poisons

The list of medical conditions and their descriptions are found in the WIC Program and the Mini-Manual. The list includes:

341 – Nutrient Deficiency Diseases	
342 – Gastrointestinal Disorders	
343 – Diabetes Mellitus	
344 – Thyroid Disorders	
345 – Hypertension and Prehypertension	
346 – Renal Disease	
347 – Cancer	
348 – Central Nervous System Disorders	
349 – Genetic and Congenital Disorders	
351 – Inborn Error of Metabolism	
352 – Infectious Disease	
353 – Food Allergies	
354 – Celiac Disease	
355 – Lactose Intolerance (low risk)*	
356 - Hypoglycemia	
359 – Recent Major Surgery, Trauma, Burns *	
360 – Other Medical Conditions affecting Nutritional status:	
	Juvenile Rheumatoid Arthritis
	Lupus Erythematosus
	Cardio Respiratory Diseases
	Heart
	Cystic
	Persist
	requir
362 – Develop	NRF 904: Environmental Tobacco Smoke Exposure (ere)
Disabilities Ir	Defined as exposure to smoke from tobacco products inside the home. Eat
381 – Oral He	
382 – Fetal Al	Low risk
	High Risk unless noted as Low Risk
	* Condition can be identified by the WIC staff

found in secondhand smoke are more likely to have asthma attacks, ear infections, allergies, wheezing and coughing spells, bronchitis and pneumonia. The poisons in secondhand smoke can also lead to childhood asthma, Sudden Infant Death Syndrome (SIDS) and behavior and learning problems in children.

Education Tips and Follow Up:

- Complete a thorough nutrition assessment as outlined in normal baby protocols.
- Provide information about the specific risks involved with secondhand smoke.
- Discuss ways the caregiver can protect the child from secondhand smoke (i.e., smoke outside; don't smoke in the car, etc.)
- Listen to the caregiver to learn what they would like to work on.
- Offer information on the smoking cessation programs and refer as appropriate.

Homelessness

A baby who lacks a fixed and regular night time residence; or whose primary night time residence is: a supervised publicly or privately operated shelter (including a welfare hotel, a congregate shelter, or a shelter for victims of domestic violence) designated to provide temporary living accommodations; an institution that provides a temporary residence for individuals intended to be institutionalized; a temporary accommodation of not more than 365 days in the residence of another individual ; or a public or private place not designed for, or ordinarily used as, a regular sleeping accommodation for human beings.

NRF 801: Homelessness

Low risk

Migrancy

A baby who is a member of a family that contains at least one individual whose principal employment is in agriculture on a seasonal basis, who has been employed within the last 24 months, and who establishes, for the purposes of such employment, a temporary residence.

NRF 802: Migrancy

Low risk

Education Tips and Follow Up

Providing effective and appropriate nutrition education to individuals who have a transient lifestyle requires that staff have an understanding of the participant's transient lifestyle. It is important to identify the caregiver's ability to provide regular healthy meals to the baby. Because a participant may only be enrolled for a short period of time, ongoing, long-term education goals may not be appropriate. Priority topics to be covered include: (1) how to use the WIC check, (2) what are WIC-allowable foods, and (3) referral to other services. Work with the caregiver to select a food package that will fit her ability to store and prepare food. Ready-to-feed formula may be necessary for the homeless baby or the non-breastfed baby of a woman with limited ability to prepare food.

Infant of Primary Caregiver with Limited Ability to Make Feeding Decisions and/or Prepare Food

Baby whose primary caregiver is assessed to have a limited ability to make appropriate feeding decisions and/or prepare food. Examples may include caregivers who are:

- Less than or equal to 17 years of age.
- Mentally disabled/delayed and/or have a mental illness such as clinical depression (diagnosed by a health care provider or licensed psychologist);
- Physically disabled to a degree which restricts or limits food preparation abilities; or
- Currently using or having a history of abusing alcohol or other drugs.

NRF 902: Infant of Primary Caregiver with Limited Ability to Make Feeding Decisions and/or Prepare Food

Low risk

Infant Born of Woman with Mental Retardation or Alcohol or Drug Abuse during Most Recent Pregnancy

Baby born of a woman:

- With presence of mental retardation diagnosed, documented, or reported by a health care provider or psychologist or someone working under a health care provider's orders, or as self-reported by applicant/participant/caregiver; or
- Documentation or self-report of any use of alcohol or illegal drugs during the most recent pregnancy.

NRF 703: Infant Born of Woman with Mental Retardation or Alcohol or Drug Abuse during Most Recent Pregnancy

Low risk

Education Tips and Follow-up:

- Cognitive limitation in a parent or primary caregiver has been recognized as a risk factor for failure to thrive, as well as abuse and neglect. The mentally disabled caregiver may not exhibit the necessary care giving skills to promote beneficial feeding interactions with the baby.
- Follow the normal nutrition protocols to identify nutritional needs.
- Discuss with the caregiver ways the WIC Program can assist in meeting the participant's nutritional needs.
- Provide education, referrals, and coordinate services to help the caregiver develop the necessary skills, and locate the resources to assist him/her in caring for the child.

Foster Care

Entering the foster care system during the previous 6 months or moving from one foster care home to another foster care home during the previous 6 months.

NRF 903: Foster Care

Low risk

Education Tips and Follow-up:

- Foster children have a high frequency of mental and physical problems that are often the result of abuse and neglect happening before foster care. They are often more likely to have inadequate nutrition.
- Follow the normal nutrition protocols to identify nutritional needs.
- Provide a baseline nutrition assessment and provide nutrition education.
- Provide referrals to resources that support the foster parent and participant's ability to be healthy.

Recipient of Abuse

Battering or child abuse/neglect within the past 6 months as self-reported, or as documented by a social worker, health care provider, or on other appropriate documents, or as reported through consultation with a social worker, health care provider, or other appropriate personnel.

NRF 901: Recipient of Abuse

Low risk

Child abuse/neglect is defined as any recent act or failure to act resulting in imminent risk of serious harm, death, serious physical or emotional harm, sexual abuse, or exploitation of a baby or child by a parent or care giver.

Education Tips and Follow-up:

- Serious neglect and abuse have short-and long-term physical, emotional, and functional consequences for children. Nutritional neglect is the most common cause of poor growth in infancy and may account for as much as half of all cases of non-organic failure to thrive.
- Follow the normal nutrition protocols to identify nutritional needs.
- Provide a baseline nutrition assessment and provide nutrition education.
- Report known or suspected child abuse or neglect. (WIC regulations regarding confidentiality do not take precedence over state laws requiring reporting of known or suspected child abuse or neglect.)

Mother either on WIC or WIC-eligible during Pregnancy

Baby less than 6 months of age whose mother was a WIC participant during pregnancy or whose mother's medical records document that the woman was at nutritional risk during pregnancy because of detrimental or abnormal nutritional conditions detectable by biochemical or anthropometric measurements or other documented nutritionally related medical conditions.

NRF 701: Infant up to 6 Months Old of WIC Mother or of a Woman who would have been Eligible During Pregnancy

Low risk

Breastfeeding Infant of Woman at Nutritional Risk

A breastfeeding baby of a woman at nutrition risk. The baby's risk must be the same priority as at-risk mother.

Education Tips and Follow-up:

- A baby born to a mother who has nutritional risks during pregnancy may not have received optimal nutrition while in the uterus and may be more likely to have nutritional problems after birth. Enrolling the baby in WIC means to ensure a healthy diet for the critical first year of life. A breastfed baby is dependent on the mother's milk as the primary source of nutrition. Inadequate maternal nutrition may result in decreased nutrient content of the milk. Special attention should therefore be given to the health and nutritional status of breastfed babies whose mothers are at nutritional risk.
- Follow the normal nutrition protocols to identify nutritional needs.
- Provide a baseline nutrition assessment and provide nutrition education.
- Provide referrals as needed.

#702A - Priority 1 infant
#702B - Priority 2 infant
#702D - Priority 4 infant
Defined as breastfeeding
Infant of Woman at
Nutritional Risk

Low risk

SELF-CHECK: PRACTICE YOUR KNOWLEDGE

- Put a check mark next to the nutrition risk factor for babies.
 - ☐ Low hematocrit/hemoglobin levels
 - ☐ Elevated blood lead levels
 - ☐ Failure to thrive
 - ☐ Cow's milk allergy
 - ☐ Jaundice
 - ☐ Substance Abuse
 - ☐ Complications of delivery
 - ☐ Gastrointestinal disorders
 - ☐ Baby up to 6 months old of WIC mother
 - ☐ Environmental tobacco smoke exposure
 - ☐ Small for gestational age
 - ☐ Breastfed baby of a priority 1 mom
 - ☐ Baby of a mom diagnosed with clinical depression
 - ☐ Homelessness
 - ☐ Breastfeeding complications or potential complications

True (T) or False (F)?

- ☐ A breastfeeding baby with a poor or weak suck can be referred to the RD/RD or lactation management specialist anytime within 30 days of risk identification.

3. ___ A 9-month old baby with hemoglobin of 9.7% (living at 5200 feet) must be referred to the WIC RD/RN for follow up.

ANSWERS

1. All letters except f and g should be checked.
2. F; The breastfeeding baby with a poor or weak suck must be referred to the RD/RN or Lactation Management Specialist that day.
3. T

Section III: Normal Infant Protocols

The following pages outline developmental patterns and baby protocols for breastfed and formula-fed babies at certification and follow-up visits. The protocols provide guidance for assessing a baby's nutritional risk and eligibility, providing nutrition education, making referrals, and following up at subsequent visits.

Normal Infant Protocol - Breastfed

1. Assessment at Certification Visit

- Check and plot weight and recumbent length.
- Check hemoglobin/hematocrit (if certified > 6 months of age).
- Complete a nutrition interview to assess for nutrition practices, health/medical, immunizations, oral health, and lifestyle risk factors.
- Assess for breastfeeding problems and concerns (utilizing the nutrition interview, infant growth grid, and through discussion with the mother).
- Assign subjective Nutrition Risk Factors (NRFs).

2. Counseling Points

- Identify and prioritize nutritional problems and concerns.
- Counsel on only one or two points at each contact based on participant's NRFs and issues of highest concern.
- Encourage good baby feeding practices.
 - Review frequency and duration of breastfeedings.
 - Discuss urine and stool output.
 - Discuss basic hunger and satiety cues.
 - Discuss breastfeeding high risk complications according to the education points outlined in the Reference Section of the *Breastfeeding Module and Resource Manual* and refer to health care provider when appropriate.
 - Discuss growth patterns and appetite spurts.
 - Discourage use of supplemental formula when establishing mother's milk supply. Discuss impact on breast milk production.
 - Baby does not need supplemental water for the first 6 months. Advise to check with baby's health care provider on recommendations for vitamin/mineral supplements (e.g. Vitamin D, iron and fluoride)
 - Introduce solid foods around 6 months of age as the baby is developmentally ready
 - Introduce self-feeding with a cup and spoon as the baby is developmentally ready.
 - A supplemental source of iron, such as iron-fortified infant cereal and/or pureed meat (especially for the breast-fed baby) should be started at 6 months.

- If baby takes a bottle, discourage:
 - Use of bottle until baby is about a month old and nursing well.
 - Taking a bottle to bed.
 - Liquids in the bottle (except expressed breast milk, formula or water for older babies), particularly sweetened water such as honey or sugar water, Kool-Aid, sports drinks, soda, or juice)
 - Use of cow's milk.
- Discourage exposure of baby to secondhand tobacco smoke which can cause breathing difficulties and more respiratory and ear infections.

Behavior Change Goal Setting

Help caregiver prioritize nutrition concerns and identify 1-2 nutrition or feeding changes that the caregiver is willing to make to improve baby's nutrition issues. Goals should be based on stages of change.

3. Refer To:

- WIC High Risk Counselor within 24 hours if the baby is identified as high risk according to NRF 135 – current weight is less than birth weight at 2 weeks of age or current weight is $\leq 92\%$ of birth weight; If the baby and mother are not able to be seen by the High Risk Counselor immediately, refer to health care provider and schedule the baby to return for a high risk appointment with the High Risk Counselor.
- WIC High Risk Counselor within 30 days if a baby 1-12 months of age has any weight gain that is less than the expected weight gain as calculated from the Minimum Expected Weight Gain Tables in the Mini-Manual.
- Lactation management specialist or High Risk Counselor if baby is identified as high risk according to NRF 603 – Breastfeeding Complications. Refer to health care provider if lactation management specialist or High Risk Counselor is not available within 24 hours to provide high-risk counseling for inadequate growth and/or breastfeeding complications.
- Clinic or health care provider for well baby care, including immunizations and vitamins/mineral supplement questions.
- Other community services as appropriate and available such as Medicaid, SNAP (Food Stamps), TANF, breastfeeding support groups, parenting classes, La Leche League.

4. Documentation

Document referrals made, pamphlets provided, client comments/follow up on goals and referrals, assessment/ counseling/ plan, and behavior change goals set.

5. Follow Up at Next Visit

- **Low-Risk Participants**
 - Review behavior change goal from previous visit. Praise caregivers for any attempted change.

- Reinforce good principles of infant nutrition, including guidance that will help caregivers anticipate the baby's developmental feeding and nutrition needs.
 - Follow up on referrals as appropriate.
 - Assess immunization record and measure weight and length at 5-7 month mid-cert visit.
 - Recommend weight and length measurements at 3- and 9-month visits.
- **High-Risk Participants**
High Risk Counselor must provide counseling according to the *High Risk Nutrition Management Protocols*.

Participants newly identified as high risk must be scheduled with High Risk Counselor per protocol (within 24 hours or one month of high-risk determination).

Normal Infant Protocol - Formula-fed

1. Assessment at Certification Visit

- Check and plot weight and recumbent length.
- Check hemoglobin/hematocrit (if certified at > 6 months of age).
- Complete a nutrition interview to assess for nutrition practices, health/medical, immunizations, oral health, and lifestyle risk factors.
- Assign Subjective Nutrition Risk Factors (NRFs).
- Refer to RD/RN within 24 hours if baby is identified as high-risk according to NRF 135 – current weight is less than birth weight at 2 weeks of age or current weight is > ½ pound less than birth weight.

2. Counseling Points

- Identify and prioritize nutritional problems and concerns.
- Counsel on only one or two points at each contact based on participant's NRFs and issues of highest concerns.
- Encourage good infant feeding practices.
 - Iron-fortified formula for the first year.
 - Appropriate frequency of feeding for young babies not yet taking solid food: at least 8 feedings in 24 hours if less than 2 months of age, or 6 feedings in 24 hours if 2 months of age or older.
 - Feed on demand.
 - Check with the baby's health care provider on recommendations for vitamin/mineral supplements.
 - Introduce solid foods around 6 months of age as the baby is developmentally ready.
 - Introduce self-feeding with a cup and spoon as the baby is developmentally ready.

- Discuss growth patterns and appetite spurts.
- Discourage:
 - Taking a bottle to bed.
 - Liquids in the bottle except formula or water (for older babies), particularly sweetened waters such as honey or sugar water, Kool-Aid, sports drinks, soda, or juice.
 - Use of cow's milk.
 - Exposure of baby to secondhand tobacco smoke which can cause breathing difficulties and more respiratory and ear infections.

3. Behavior Change Goal Setting

Help caregivers prioritize nutrition concerns and identify 1-2 nutrition or feeding changes that the caregiver is willing to make to improve baby's nutrition issues. Goals should be based on stages of change.

4. Refer To:

- WIC High Risk Counselor within 24 hours if baby is identified as high-risk according to NRF 135 – current weight is less than birth weight at 2 weeks of age or current weight is $\leq 92\%$ of birth weight; If the baby and mother are not able to be seen by the High Risk Counselor immediately, refer to health care provider and schedule the baby to return for a high risk appointment with the High Risk Counselor.
- WIC High Risk Counselor within 30 days if a baby 1-12 months of age has any weight gain that is less than the expected weight gain as calculated from the Minimum Expected Weight Gain Tables in the Mini-Manual.
- Clinic or health care provider for well baby care, including immunizations.
- Other community services as appropriate and available such as Medicaid, SNAP (Food Stamps), TANF, parenting classes.

5. Documentation

Document referrals made, pamphlets provided, client comments/follow up on goals and referrals, assessment/counseling/ plan, and behavior change goals set.

6. Follow up at Next Visit

- **Low-Risk Participants**
 - Review behavior change goal from previous visit. Praise caregiver for any attempted change.
 - Reinforce good principles of baby nutrition, including guidance that will help caregivers anticipate the baby's developmental feeding and nutrition needs.
 - Follow up on referrals as appropriate.
 - Assess immunization record and measure weight and length at 5-7 month mid-cert visit.
 - Recommend measurement of weight and length at 3- and 9-month visits.

- **High-Risk Participants**

High Risk Counselor must provide counseling according to the *High Risk Nutrition Management Protocols*.

Participants newly identified as high risk must be scheduled with High Risk Counselor per protocol (within 24 hours or one month of high-risk determination).

Training Activity

Once you have completed this module, please take the on-line test. For access instructions please visit the Colorado WIC website. **All the best!**